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Money. portion of the existing contracts must have been adjusted with reference to it. No wonder, therefore, that debtors should have felt indignant at the shameful act of injustice done them by this enhancement of the value of money, and have refused to make good their engagements, otherwise than in money of the value of that which had been current when they were entered into. The labouring class, to whom every sudden change in the value of money is injurious, having joined the debtors in their opposition, they broke out into open rebellion. "The people," says Le Blanc, "being reduced to despair, and having no longer any thing to care for, lost the respect due to the edict of his Majesty; —they pillaged the house of the master of the mint, who was believed to have been the chief adviser of the measure, besieged the temple, in which the king lodged, and did all that an infuriated populace is capable of doing." (*Traité Historique des Monnoyes de France*, p. 190.) The sedition was ultimately suppressed; but it is not mentioned whether any abatement were made, by authority, from the claims of the creditors, in the contracts entered into when the light money was in circulation. It seems probable, however, from what is elsewhere mentioned by Le Blanc (Introduction, p. 30,) that such was really the case.

Increase of the value of the English coins in the reign of Edward VI

The history of the French coinage affords several instances similar to the very remarkable one we have now brought under the notice of our readers; but, in England, the new coinage in the last year of the reign of Edward VI. is the only instance in which the value of money has been augmented by the direct interference of government. Previously to the accession of Henry VIII., the pound of standard silver bullion, containing 11 oz. 2 dwts. of pure silver, and 13 dwts. of alloy, was coined into thirty-seven shillings and sixpence. But Henry not only increased the number of shillings coined out of a pound weight of silver, but also debased its purity. The degradation was increased under his son and successor, Edward VI., in the fifth year of whose reign, seventy-two shillings were coined out of a pound weight of bullion; but as this bullion contained only *three* ounces of pure silver to *nine* ounces alloy, twenty of these shillings were only equal to 4s. 7¾d. of our present money, including the seignorage. (Folkes's *Table of English Coins*, p. 34.) It appears from the proclamations issued at the time, and foom other authentic documents, that this excessive reduction of the value of silver money had been productive of the greatest confusion. A *maximum* was set on the price of corn and other necessaries; and letters were sent to the gentlemen of the different counties, desiring them to punish those who refused to carry their grain to market. But it was soon found to be quite impossible to remedy these disorders otherwise than by withdrawing the base money from circulation. This was accordingly resolved upon; and, in 1552, new coins were issued, the silver of which was of the old standard of purity, and which, though less valuable than those in circulation, during the early part of the reign of Henry VIII., were above *four* times the value of a large proportion of the coins of the same denomination that had been in circulation for some years before.

It is certain, however, that such a rise in the value of money could not have taken place without occasioning the most violent commotions, had *all* the coins previously in circulation been debased. Equal injustice, it must be remembered, is always done to the poorest, and not least numerous class of society, by increasing the value of money, that is done to the wealthier classes by depressing it. But, though government had been disposed to sanction so enormous an invasion of the right of property, it is altogether impossible that the country could have submitted to have had 400 or 450 per cent. added to its taxes and other public burdens, by a legerdemain trick of this kind, or that individuals would have consented to pay so much more than they had originally bargained for. Instead of deserving praise for accomplishing such a measure, Edward VI., who began the reformation of the coins, and Elizabeth, by whom it was completed, would have justly forfeited the esteem of their subjects, and lost all their popularity. The truth is, however, that little or no change had been made, during all this period, in the value of the *gold* coins; and there is, besides, abundance of evidence to show, that many of the old silver coins had remained in circulation. Now, as there is no mention made of the issue of the new coins having been attended with any inconvenience, it is nearly certain, as Mr. Harris has remarked, that, during the period of the debasement of the standard, individuals had regulated their contracts chiefly with reference to the gold or old silver coins; or, which is the same thing, that "they had endeavoured, as well as they could, *to keep by the standard, as it had been fixed in the preceding times.*" (Harris *on Coins*, part ii. p. 3.)

We have been thus particular in examining this measure, because it has been much referred to. It is plain, however, that it can give no support to the arguments of those who appeal to it as affording a striking proof of the benefits which they affirm must always result from restoring a debased or degraded currency to its original purity or weight. Invariability of value is the great desideratum in a currency. To elevate the standard after it has been for a considerable period depressed, is really not a measure of justice, but the giving *a new direction to injustice.* It vitiates and falsifies the provisions in one set of contracts, in order properly to adjust those in some other set.

This, however, as already remarked, is the only instance in which the government of England has ever interfered directly to enhance the value of money. In every other case, where they have tampered with the standard, it has been to lower its value, or, which comes to the same thing, to reduce their own debts and those of their subjects.

Pernicious effects of a reduction of the standard.

It is unnecessary to enumerate in detail the various bad consequences that must have resulted from these successive changes in the standard of value. But, it deserves to be remarked, that an arbitrary reduction of the standard does not afford any real relief to the governments by whom it is practised. Their *debts* are, it is true, reduced proportionally to the reduction in the value of the currency, but their *revenues* are, at the same time, reduced in the same proportion. A piece of money that has been degraded will not exchange for the same quantity of commodities that it previously did. To whatever extent the standard may be reduced, prices are very soon raised to the same extent. If the degradation be 10 per cent., government, as well as every one else, will, henceforth, be compelled to pay L.110 for commodities previously obtainable for L.100. Hence to bring the same real value into the coffers of the treasury, it is necessary that taxation should be increased whenever the standard is diminished; a measure always odious, and sometimes impracticable.

But a diminution of revenue is not the only bad effect which governments experience from reducing the standard of the currency. A state which has degraded its money, and cheated its creditors, is unable to borrow again on the same favourable terms as if it had acted with good faith. We cannot expect to enjoy the reputation of honesty, at the same time that we are openly pocketing the booty earned by duplicity and fraud. Those who lend money to knaves always stipulate for a proportionally high rate of interest. They must not only obtain as much as may be obtained from the most secure investments, but they must also obtain an *additional* rate or premium, to cover the risk they run in transacting with those who have given proofs of bad faith, and on whose promises no reliance can be placed. A degradation of the standard of value is, therefore, of all others, the most wretched resource of a bankrupt govern-

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Money. ment. It will never, indeed, be resorted to, except by those who are alike unprincipled and ignorant. "It occasions," says Dr. Smith, "a general and most pernicious subversion of the fortunes of private people; enriching, in most cases, the idle and profuse debtor at the expence of the frugal and industrious creditor; and transporting a great part of the national capital from the hands which were likely to increase and improve it, to those which are likely to dissipate and destroy it. When it becomes necessary for a state to declare itself bankrupt, in the same manner as when it becomes necessary for an individual to do so, a fair, open, and avowed bankruptcy, is always the measure which is both least dishonourable to the debtor, and least hurtful to the creditor. The honour of a state is surely very poorly provided for, when, in order to cover the disgrace of a real bankruptcy, it has recourse to a juggling trick of this kind, so easily seen through, and at the same time so utterly pernicious."—(*Wealth of Nations*, vol. iv. p. 42.)

Some of the bad consequences resulting from a change in the value of money might, indeed, be obviated, by enacting, that the stipulations in all preceding contracts should be made good, not according to the present value of money, but to its value at the time when they were entered into. This principle, which is conformable to the just maxim of the civil law (*Valor monetæ considerandus atque inspiciendus est, a tempore contractus, non autem a tempore solutionis*) was acted upon, to a certain extent, at least, by the kings of France, during the middle ages. Ordonnances of Philip le Bel, Philip of Valois, and Charles VI., issued subsequently to their having *increased* the value of money, or, as the French historians term it, returned from the *foible* to the *forte* monnoie, are still extant, in which it is ordered, that all previous debts and contracts should be settled by reference to the previous standard. But though the same reason existed, it does not appear that any such ordonnances were ever issued when the value of money was degraded. It is obvious, indeed, that no government could derive any advantage whatever from reducing the value of money, were it to order, as it is in justice bound to do, that all *existing* contracts should be adjusted by the old standard. Such a measure would reduce the revenue without reducing the incumbrances of the state; whilst, by establishing a new standard of value, and unsettling all the notions of the public, it would open a door for the grossest abuses, and be productive of infinite confusion and disorder in the dealings of individuals.

The odium and positive disadvantage attending the degradation of metallic money, appear to have at length induced most governments to abstain from it. But they have only renounced one mode of playing at fast and loose with the property of their subjects, to adopt another and a still more pernicious one. The injustice which was formerly done by diminishing the quantity of bullion contained in the coins of different countries, is now perpetrated with greater ease, and to a still more ruinous extent, by the depreciation of their paper currency.[1]

From 1601 to 1797, no change made in the standard.

In the long period from 1601 to 1697, no change was made in the standard of money in this country. A project for enfeebling the standard had indeed been entertained, both in 1626 and 1695; but, in the former instance, it was quashed by the celebrated speech addressed by Sir Robert Cotton to the Lords of the Privy Council, and in the latter by the opposition of Mr. Montague, then Chancellor of the Exchequer, in the House of Commons, and by the impression made by the writings of Mr. Locke, by whom the injustice of the scheme was admirably exposed, out of doors. It was reserved for Mr. Pitt to set aside a standard which had been preserved inviolate for nearly two centuries. The Order in Council of the 25th February 1797, and the acts of Parliament by which it was followed up, effected a total change in our ancient monetary system; and, instead of the old standard, gave us the *self-interested views and opinions of twenty-four irresponsible individuals*. The circulation of Bank of England paper was secured, by its being exclusively issued in payment of the interest of the public debt, and by its also being received as cash in all payments into the exchequer; but no attempt was made to sustain the value of this paper on a par with the value of gold or silver. Full power was given to the directors of the Bank to raise or depress the value of money, as their interest or caprice might suggest. They were enabled to exchange unlimited quantities of scraps of engraved paper, of the intrinsic worth, perhaps, of 5s. a quire, for as many, or the value of as many, hundreds of thousands of pounds. And, in such circumstances, our only wonder is, not that paper money became depreciated, but that its value was not more reduced, and that a still greater quantity of bank-notes were not thrust into circulation.

Effects of the restriction in 1797 in degrading the value of bank paper.

For the first three or four years after the restriction, the Directors, unaware, perhaps, of the nature of the immense power placed in their hands, seem to have regulated their issues nearly on the same principles that had regulated them, while they were obliged to pay in coin. It appears from the *Tables of the Price of Bullion*, published by order of the House of Commons, that until 1801, bank-notes were on a par with gold. In 1801 and 1802, however, they were at a discount of from $8\frac{1}{3}$ to $7\frac{1}{3}$ per cent.; but they again recovered their value; and from 1803 to 1809, both inclusive, they were only at a discount of £2, 13s. 2d. per cent. But in 1809 and 1810, the Directors appear to have totally lost sight of every principle by which their issues had previously been governed. The average amount of bank-notes in circulation, which had never exceeded $17\frac{1}{2}$ millions, nor fallen short of $16\frac{1}{2}$ millions, in any one year, from 1802 to 1808, both inclusive, was in 1809 raised to £18,927,833; and, in 1810, to £22,541,523. The issues of country bank paper were increased in a still greater proportion; and, as there was no corresponding increase in the business of the country, the discount on bank-notes rose from £2, 13s. 2d., in 1809, to £13, 9s. 6d. per cent. in 1810. The recommendation to return to cash payments, contained in the *Report of the Bullion Committee*, presented to the House of Commons in 1810, appears to have given a slight check to the issues of the Bank. All apprehensions from this quarter were, however, speedily dissipated; for in May 1811, when guineas were notoriously bought at a premium, and bank-notes were at an open discount, as compared with gold bullion, of upwards of ten per cent., the House of Commons not only refused to fix any certain period for reverting to cash payments, but actually voted a resolution, declaring that the promissory notes of the Bank of England had *hitherto been, and were then, held to be, in public estimation, equivalent to the legal coin of the realm*.

Extraordinary resolution of the House of Commons.

This memorable resolution; a resolution which took for granted that a part was equal to a whole; that £90 and £100 were the same thing; relieved the Bank from all uneasiness respecting the interference of Parliament, and tempted the Directors to increase the amount of paper in circulation. The consequence was, that in 1812, it was at an average discount of $20\frac{3}{4}$; in 1813, of 23; and, in 1814, of 25 per cent. This was the *maximum* of depreciation. The importation of foreign corn, subsequent to the opening of the Dutch ports in 1814, having occasioned a great decline of the price of the principal article of agricultural produce, produced an unprecedented degree of distress, first among the farmers, and latterly among the country bankers. It

[1] In the last volume of the *Cours d'Economie Politique* of M. Storch, there is a very instructive account of the paper money of the different continental states. We can confidently recommend it as containing much useful information.

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Bankruptcy of the country banks in 1814, 1815, and 1816, cause of the rise in the value of bankpaper.

is estimated that, in 1814, 1815 and 1816, no fewer than 240 private banking companies either became altogether bankrupt, or, at least, stopped payment; and the reduction that was thus occasioned in the quantity of bank-notes in circulation, raised their value so rapidly, that, in October 1816, the discount was reduced to L.1, 8s. 7d. per cent. In 1817 and 1818, the average discount on bank paper, as compared with gold, did not exceed L.2, 13s. 2d. per cent. In the early part of 1819, it rose to about six per cent., but it very soon declined; and in 1820 and 1821 paper was nearly on a level with gold. (See Table No. V. annexed to this article.)

These fluctuations were exceedingly injurious. From 1809 to 1815, the creditors of every antecedent contract, land-holders whose estates had been let on lease, stock-holders, and annuitants of every description—all, in short, who could not raise the nominal amount of their claims or of their incomes proportionally to the fall in the real value of money, were to this extent losers. The injustice that would have been done to the creditors of the state and of individuals, who had made their loans in gold, or paper equivalent to gold, by raising the denomination of the coin twenty-five per cent., however gross and palpable, would not have been greater than was actually done them in 1814, by compelling them to receive payment of their just debts in paper depreciated to that extent. Circumstances which could neither be controlled by the Bank of England nor the government, put an end, as has been seen, to this system. But we suffered much, and perhaps are still suffering somewhat from the sacrifices imposed by the rise in the value of money.

And yet, strange to say, there is a considerable party amongst us who, are even now, (1837) at the end of eighteen or twenty years, clamouring for a fresh reduction of the standard. It is no doubt true, that after a currency has been for a considerable period depreciated, equal injustice is done by again raising its value, as was done by first depressing it. There is good reason, however, to doubt, whether the depreciation from 1809 to 1815 (for the depreciation of 2½ per cent. during the seven preceding years is too inconsiderable to be taken into account) extended over a sufficiently lengthened period to have warranted the legislature in departing from the old standard. But, without giving any opinion on this point, which is confessedly one of considerable difficulty, it is sufficient to remark, that the value of the currency was raised, *independently altogether of the interference of government.* The destruction of country bank paper, occasioned by the renewed intercourse with the continent, and the consequent introduction of cheap foreign corn, raised the value of paper, in October 1816, to within 1½ per cent. of par. Now, as the act 59 Geo. III. was not passed until 1819, and as the currency had not been depreciated in the interim, we confess our inability to discover the grounds on which *it* is affirmed to have been the *cause* of that rise in the value of money which took place *three years before it was in existence.* The proceedings in 1819 did not really add three per cent.[1] to the value of bank paper, nor were they intended to raise it. Their great object was to shut the door against a *new* depreciation, and to prevent paper, which had for three years been nearly on a level with gold, being again degraded. By maintaining the *old* standard, or, which is the same thing, by maintaining the currency at a value nearly corresponding to that to which it had attained in 1816, 1817, and 1818, Parliament certainly gave permanence to the injury which the rise in the value of money had occasioned to the debtors in all the contracts entered into between 1810 and 1815; but if, instead of maintaining this old standard, they had raised the mint price of bullion to its market price in 1814, they would have done an equal injury to the far more numerous body of creditors, in *all the contracts entered into previously to* 1810, *and in the three years subsequent to autumn* 1816.

Act 59th Geo. III. did not raise the value of the currency.

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Under these circumstances, it was impossible to adopt any measure capable of giving general satisfaction to those whose interests were so widely different; and against which many plausible, and even forcible objections, might not have been stated. We are firmly persuaded, however, that the legislature followed that course which was, on the whole, the wisest, and most advantageous. It must be remembered, that much of that inconvenience and distress, which always result from every sudden rise in the value of money, had been got over in 1817 and 1818. The rents of such farms as had been let during the depreciation had been very generally reduced, a vast number of annuity bonds had been cancelled, and prices and wages had begun to accommodate themselves to the new scale of value. Sir Robert Peel's bill gave stability to arrangements which had been brought about by the natural course of events; and, by fixing the standard at its former limit, secured us, as long at least as we have good sense and honesty to maintain it inviolate, against the risk of future derangement and fluctuation.

Standard as now fixed ought to be maintained inviolate.

But, even if it could be shewn that the 59 Geo. III. was inexpedient at the time when it was passed, that would add nothing to the plea of those who are now contending for its repeal. All the objections which it was possible to make to the degradation of the standard in 1819, must apply with a thousand times the force to every scheme for degrading it in 1837; while, on the other hand, all the arguments that could have been urged in favour of the measure at the former period are now quite worthless. The restored standard has been maintained for eighteen years: and ninety-nine out of every hundred of the existing contracts have been entered into with reference to it. To tamper with it now would be the extreme of madness. We should again witness the most pernicious subversion of private fortunes. Debtors would be enriched at the expence of their creditors; the ignorant and unwary would become the prey of the cunning and the crafty; and capitalists would be eager to transfer their stock from a country where it was impossible to lend it, except at the risk of getting it repaid in a depreciated currency. "Whatever, therefore," to avail ourselves of the just and forcible expressions of Mr. Harris, "may be the fate of future times, and whatever the exigency of affairs may require, it is to be hoped that that most awkward, clandestine, and most direful method, of cancelling debts by debasing the standard of money, will be the last that shall be thought of."—(*On Money and Coins*, part ii. p. 108.)

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[1] At the period when Sir Robert Peel's bill was passed, bullion was at L.4 an ounce; consequently, the depreciation was only L.2, 13s. 2d. per cent.

TABLES RELATIVE TO THE MONEY OF GREAT BRITAIN AND OTHER COUNTRIES.

No. I.

ENGLISH MONEY.—*Account of the English silver and gold coins; shewing their value; the seignorage or profit upon the coinage, and the price paid to the public by the mint, for the pound troy of standard gold and silver, from the Conquest to the year* 1816. *(This and the next table, No. II., are taken from Part II. of* Essays on Money, Exchanges, and Political Economy, *by Henry James.)*

A. D.	Anno Regni.	SILVER. 1. Fineness of the silver in the coins.	2. Pound weight of such silver coined into	3. Profit or seignorage on the coinage.	4. Prices paid to the public for the pound-wt. of silver.	5. Equal to the mint-price for standard silver of 11 oz. 2 dts. fine troy-weight.	GOLD. 6. Fineness of the gold in the coins.	7. Pound-weight of such gold coined into	8. Profit or seignorage on the coinage.	9. Price paid to the public for the pound-weight of gold.	10. Equal to the mint-price for standard gold of 22 carats fine troy-wt.
		oz. dts.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	crts. gns.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1066	Conquest.....	11 2	1 0 0	.....	.....	.....	... ...	.....	.....	.....	.....
1280	8 Edward I...	— —	1 0 0	0 1 0	0 19 0	1 0 $3\frac{1}{3}$	... ...	.....	.....	.....	.....
1300	28 ———	— —	1 0 3	0 1 $2\frac{1}{2}$	0 19 $0\frac{1}{2}$	.....	... ...	.....	.....	.....	.....
1344	18 Edward III.	— —	1 0 3	0 1 3	0 19 0	1 0 $3\frac{1}{3}$	23 $3\frac{1}{2}$	13 3 4	0 8 4	12 15 0	12 10 8
1349	23 ———	— —	1 2 6	0 1 3	1 1 3	1 2 8	— —	14 0 0	0 11 8	13 8 4	13 3 9
1356	30 ———	— —	1 5 0	0 0 10	1 4 2	1 5 $9\frac{1}{3}$	— —	15 0 0	0 6 8	14 13 4	14 8 4
1394	18 Richard II..	— —	1 5 0	0 0 10	1 4 2	1 5 $9\frac{1}{3}$	— —	15 0 0	0 5 0	14 15 0	14 9 11
1401	3 Henry IV..	— —	1 5 0	0 0 10	1 4 2	1 5 $9\frac{1}{3}$	— —	15 0 0	0 5 0	16 15 0	14 9 11
1421	9 Henry V....	— —	1 10 0	0 1 0	1 9 0	1 10 $11\frac{1}{3}$	— —	16 13 4	0 5 0	16 8 4	16 2 9
1425	4 Henry VI..	— —	1 10 0	0 1 0	1 9 0	1 10 $11\frac{1}{3}$	— —	16 13 4	0 5 10	16 7 6	16 1 11
1464	4 Edward IV.	— —	1 17 6	0 4 6	1 13 0	1 15 $2\frac{1}{3}$	— —	20 16 8	2 10 0	18 6 8	18 0 5
1465	5 ———	— —	1 17 6	0 4 6	1 13 0	1 15 $2\frac{1}{3}$	— —	22 10 0	1 0 10	21 9 2	21 1 10
1470	49 Henry VI..	— —	1 17 6	0 2 0	1 15 6	1 17 $10\frac{2}{3}$	— —	22 10 0	0 13 0	21 17 0	21 9 7
1482	22 Edward IV.	— —	1 17 6	0 1 6	1 16 0	1 18 $4\frac{4}{3}$	— —	22 10 0	0 7 6	22 2 6	21 15 0
1483	1 Rich. III...	— —	1 17 6	0 1 6	1 16 0	1 18 $4\frac{4}{3}$	— —	22 10 0	0 7 6	22 2 6	21 15 0
1485	1 Henry VII.	— —	1 17 6	0 1 6	1 16 0	1 18 $4\frac{4}{3}$	— —	22 10 0	0 7 6	22 2 6	21 15 0
1509	1 Henry VIII.	— —	1 17 6	0 1 0	1 16 6	1 18 $11\frac{1}{3}$	— —	22 10 0	0 2 6	22 7 6	22 0 0
[1]1527	18 ———	— —	2 0 0	0 1 $0\frac{4}{3}$	1 18 $11\frac{1}{3}$	1 18 $11\frac{1}{3}$	— —	24 0 0	0 2 8	23 17 4	22 0 0
———	— ———	— —	2 5 0	0 1 0	2 4 0	2 4 0	— —	27 0 0	0 2 9	26 17 3	.....
.....	.....	... ...	.....	.....	.....	.....	22 0	25 2 6	0 3 0	24 19 6	24 19 6
1543	34 ———	10 0	2 8 0	0 8 0	2 8 0	2 4 $4\frac{4}{3}$	23 0	28 16 0	1 4 0	27 12 0	26 8 0
1545	36 ———	6 0	2 8 0	2 0 0	2 16 0	2 11 $9\frac{3}{3}$	22 0	30 0 0	2 10 0	27 10 0	27 10 0
1546	37 ———	4 0	2 8 0	4 4 0	3 0 0	2 15 6	20 0	30 0 0	5 0 0	27 10 0	27 10 0
1547	1 Edward VI.	4 0	2 8 0	4 4 0	3 0 0	2 15 6	20 0	30 0 0	1 10 0	28 10 0	31 7 0
1549	3 ———	6 0	3 12 0	4 0 0	3 4 0	2 19 $2\frac{2}{3}$	22 0	34 0 0	1 0 0	33 0 0	33 0 0
1551	5 ———	3 0	3 12 0	.....	.....	.....	... ...	.....	.....	.....	.....
———	– ———	11 0	3 0 0	.....	.....	.....	23 $3\frac{1}{2}$	36 0 0	.....	.....	.....
———	– ———	... ...	.....	.....	.....	.....	22 0	33 0 0	.....	.....	.....
1552	6 ———	11 1	3 0 0	0 1 0	2 19 0	2 19 $3\frac{1}{3}$	23 $3\frac{1}{2}$	36 0 0	0 2 9	35 17 3	.....
———	– ———	... ...	.....	.....	.....	.....	22 0	33 0 0	0 3 0	32 17 0	32 17 0
1553	1 Mary.....	11 0	3 0 0	0 1 0	2 19 0	2 19 $6\frac{2}{3}$	23 $3\frac{1}{2}$	36 0 0	0 3 0	35 17 0	33 0 8
1560	2 Elizabeth...	11 2	3 0 0	0 1 6	2 18 6	2 18 6	23 $3\frac{1}{2}$	36 0 0	0 5 0	35 15 0	.....
———	– ———	... ...	.....	.....	.....	.....	22 0	33 0 0	0 4 0	32 16 0	32 16 0
1600	43 ———	— —	3 2 0	0 2 0	3 0 0	3 0 0	23 $3\frac{1}{2}$	36 10 0	0 10 0	36 0 0	.....
———	— ———	... ...	.....	.....	.....	.....	22 0	33 10 0	0 10 0	33 0 0	33 0 0
1604	2 James I.....	— —	3 2 0	0 2 6	2 19 6	2 19 6	22 0	37 4 0	1 10 0	35 14 0	35 14 0
1626	2 Charles I...	— —	3 2 0	0 2 0	3 0 0	3 0 0	— —	41 0 0	1 1 5	39 18 7	39 18 7
[2]1666	18 Charles II..	— —	3 2 0	0 0 0	3 2 0	3 2 0	— —	44 10 0	0 0 0	44 10 0	44 10 0
1717	3 George I...	— —	3 2 0	0 0 0	3 2 0	3 2 0	— —	46 14 6	0 0 0	46 14 6	46 14 6
1816	56 George III.	— —	3 6 0	0 4 0	.....	.....	— —	46 14 6	0 0 0	46 14 6	46 14 6

[1] 1527, Henry VIII.] The Saxon or Tower-pound was used at the mint up to this time, when the pound troy was substituted in its stead. The Tower-pound was but 11 oz. 5 dwts. troy; so that, from the Conquest to the 28th of Edward I., twenty shillings in tale were exactly a pound in weight.

1666, 18 Charles II.] The seignorage on the coinage was at this time given up, and the gold bullion brought to the mint has ever since been coined free of expence. A seignorage of $6\frac{14}{31}$ per cent. was imposed on the coinage of silver by 56th Geo. III.

No. II.

ENGLISH MONEY.—*Account of the quantity of fine silver coined into* 20*s. or the pound sterling; the quantity of standard silver, of* 11 *oz.* 2 *dwts. fine, and* 18 *dwts. alloy, contained in* 20*s. or the pound sterling, and the quantity of standard silver which was delivered to the mint, by the public, for* 20*s. of silver money, in the different reigns, from the time of Edward I. to the reign of George III. A similar account with respect to gold. And an account of the proportionate value of fine gold to fine silver, according to the number of grains contained in the coins; and the proportionate value of fine gold to fine silver, according to the price paid by the mint to the public.* Calculated in grains and 1000 parts troy-weight.

A. D.	Anno Regni.	SILVER. 1. Number of grains of fine silver in 20 shillings, or the pound sterling, as coined by the mint indentures.	SILVER. 2. Number of grains of standard silver, 14 oz. 2 dwts. fine in 20s. or the pound sterling, as coined by the mint indentures.	SILVER. 3. Number of grains of standard silver which 20s. were worth, according to the price paid by the mint to the public.	GOLD. 4. Number of grains of fine gold in 20s. or the pound sterling as coined by the mint indentures.	GOLD. 5. Number of grains of standard gold, 22 carats fine in 20s. or the pound sterling as coined by the mint indentures.	GOLD. 6. Number of grains of standard gold which 20s. were worth, according to the price paid by the mint to the public.	7. Proportionate value of fine gold to fine silver, according to the quantity of each metal contained in the coins.	8. Proportionate value of fine gold to fine silver, according to the mint price, or the presumed market-value of gold and silver.
		Grains.	*Grains.*	*Grains.*	*Grains.*	*Grains.*	*Grains.*	*Gold to silver.*	*Gold to silver.*
1066	Conquest	4995·000	5400·000	.....	.....	.....	.....	.....	.....
1280	8 Edward I...	4995·000	5400·000	5684·210	.....	.....	.....	.....	.....
1344	18 Edward III.	4933·333	5333·333	5684·210	407·990	445·080	459·625	1 to 12·091	1 to 12·479
1349	23 ———	4440·000	4800·000	5082·352	383·705	418·588	436·777	1 — 11·571	1 — 11·741
1356	30 ———	3996·000	4320·000	4468·965	358·125	390·682	399·561	1 — 11·558	1 — 11·286
1401	3 Henry IV..	3996·000	4320·000	4468·965	358·125	390·682	397·303	1 — 11·158	1 — 11·350
1421	9 Henry V...	3330·000	3600·000	3724·137	322·312	351·613	356·963	1 — 10·331	1 — 10·527
1464	4 Edward IV.	2664·000	2880·000	3272·727	257·850	281·291	319·648	1 — 10·331	1 — 10·331
1465	5 ———	2664·000	2880·000	3272·727	238·750	260·454	273·109	1 — 11·158	1 — 11·983
1470	49 Henry VI..	2664·000	2880·000	3042·253	238·750	260·454	268·202	1 — 11·158	1 — 11·446
1482	22 Edward IV.	2664·000	2880·000	3000·000	238·750	260·454	264·869	1 — 11·158	1 — 11·429
1509	1 Henry VIII.	2664·000	2880·000	2958·904	238·750	260·454	261·909	1 — 11·158	1 — 11·400
1527	18 ———	2368·000	2560·000	2618·181	210·149	229·253	230·630	1 — 11·268	1 — 11·455
1543	34 ———	2000·000	2162·162	2594·594	191·666	209·090	218·181	1 — 10·434	1 — 12·000
1545	36 ———	1200·000	1297·297	2223·938	176·000	192·000	209·454	1 — 6·818	1 — 10·714
1546	37 ———	800·000	864·864	2075·675	160·000	174·545	209·454	1 — 5·000	1 — 10·000
1547	1 Edward VI.	800·000	864·864	2075·675	160·000	174·545	183·732	1 — 5·000	1 — 11·400
1549	3 ———	800·000	864·864	1945·945	155·294	169·412	174·545	1 — 5·151	1 — 11·250
[1]1551	5 ———	400·000	.....	.....	.....	.....	.....	.....	.....
———	– ———	1760·000	1902·702	.....	160·000	174·545	.....	1 — 11·000	.....
1552	6 ———	1768·000	1911·351	1943·757	160·000	174·545	175·342	1 — 11·050	1 — 11·186
1553	1 Mary.....	1760·000	1902·702	1935·050	159·166	173·636	174·369	1 — 11·057	1 — 11·198
1560	2 Elizabeth...	1776·000	1920·000	1969·230	160·000	174·545	175·609	1 — 11·100	1 — 11·315
1600	43 ———	1718·709	1858·064	1920·000	157·612	171·940	174·545	1 — 10·904	1 — 11·100
1604	2 James I.....	1718·709	1858·064	1936·134	141·935	154·838	161·344	1 — 12·109	1 — 12·109
1626	2 Charles I...	1718·709	1858·064	1920·000	128·780	140·487	144·255	1 — 13·346	1 — 13·431
1666	18 Charles II...	1718·709	1858·064	1858·064	118·651	129·438	129·438	1 — 14·485	1 — 14·485
1717	3 George I...	1718·709	1858·064	1858·064	113·001	123·274	123·274	1 — 15·209	1 — 15·209
[2]1816	56 George III.	1614·545	1745·454	.....	113·001	123·274	123·274	1 — 14·287	.....

[1] 1551, 5 Edward VI.] The coinage of debased silver money in the 5th year of Edward VI. of 3 oz. fine, ought more properly to be considered as tokens. The sum of £120,000 only was so coined. (See James's *Essays*, chap. iv.)

[2] 1816, 56 George III.] The government having taken the coinage of silver into its own hands, there is at present no fixed price paid to the public, by the mint for standard silver. And supposing the government to continue the present mint regulations, and to keep gold at 77s. 10½d. an ounce, as the price of silver varies, the relative value of gold to silver will vary in like proportion.

Tables. No. III.—Scots Money.—*Account of the Number of Pounds, Shillings, and Pennies Scots, which have been coined out of One Pound Weight of Silver, at different times; with the degree of Purity of such Silver, or its Fineness, from the year* 1107 *to the year* 1601. (From Cardonnell's *Numismata Scotiæ*, p. 24.) Tables.

A. D.	Anno Regni.	Purity.	Alloy.	Value of money coined out of a lb. of silver.	A. D.	Anno Regni.	Purity.	Alloy.	Value of money coined out of a lb. of silver.
		Oz. Pw.	Oz. Pw.	L. s. d.			Oz. Pw.	Oz. Pw.	L. s. d.
From 1107 to 1296	Alexander I... David I..... William..... Alexander II.. Alexander III. John Baliol....	11 2	0 18	1 0 0	1451	James II.....15	11 2	0 18	3 4 0
					1456	20	11 2	0 18	4 16 0
					1475	James III.....16	11 2	0 18	7 4 0
					1484	24	11 2	0 18	7 0 0
					1488	James IV.. 1	11 2	0 18	7 0 0
					1489	2			
From 1306 to 1329	Robert I.....	11 2	0 18	1 1 0	1529	James V.....16	11 0	1 0	9 12 0
					1544	Mary.....3	11 0	1 0	9 12 0
					1556	14	11 0	1 0	13 0 0
					1565	23	11 0	1 0	18 0 0
1366	David II.....38	11 2	0 18	1 5 0	1567	James VI.....1	11 0	1 0	18 0 0
1377	39	11 2	0 18	1 9 4	1571	5	9 0	3 0	16 14 0
From 1371 to 1390	Robert II.....	11 2	0 18	1 9 4	1576	10	8 0	4 0	16 14 0
					1579	13	11 0	1 0	22 0 0
					1581	15	11 0	1 0	24 0 0
					1597	31	11 0	1 0	30 0 0
1393	Robert III.....4	11 2	0 18	1 12 0	1601	35	11 0	1 0	36 0 0
1424	James I.....19	11 2	0 18	1 17 6					

No. IV.—Scots Money.—*Account of the Number of Pounds, Shillings, and Pennies Scots, which have been coined out of One Pound Weight of Gold; with the degree of their Purity, and the proportion that the Gold bore to the Silver.* (Ib. p. 25.)

A. D.	Anno Regni.	Fineness.	Alloy.	Value of the coin coined out of one pound of gold.	Pound of pure gold weighed of pure silver.
		oz. pw. gr.	oz. pw. gr.	L. s. d.	lb. oz. pw. gr.
1371, &c.	Robert II.....	11 18 18	0 1 6	17 12 0	11 1 17 22
1390, &c.	Robert III...	11 18 18	0 1 6	19 4 0	11 1 17 22
1424	James I....19	11 18 18	0 1 6	22 10 0	11 1 17 22
1451	James II...15	11 18 18	0 1 6	33 6 0	9 8 4 14
1456	20	11 18 18	0 1 6	50 0 0	9 8 4 14
1475	James III. 16	11 18 18	0 1 6	78 15 0	10 2 0 20
1484	24	11 18 18	0 1 6	78 15 0	10 5 7 9
1488	James IV...1	11 18 18	0 1 6	78 15 0	10 5 7 9
1529	James V...16	11 18 18	0 1 6	108 0 0	10 5 7 9
1556	Mary.....14	11 0 0	1 0 0	144 0 0	10 5 8 6
1577	James VI..10	11 0 0	1 0 0	240 0 0	10 5 8 6
1579	13	10 10 0	1 10 0	240 0 0	11 5 2 20
1597	31	11 0 0	1 0 0	360 0 0	12 0 0 0
1601	35	11 0 0	1 0 0	432 0 0	12 0 0 0
1633	Charles I....9	11 0 0	1 0 0	492 0 0	13 2 7 11

No. V.—English Paper Money.—*Account of the Average Market Price of Bullion in every year, from* 1800 *to* 1821, *(taken from papers laid before the House of Commons), of the average value per cent. of the Paper Currency, estimated from the market price of Gold for the same period, and of the average depreciation of the Paper Currency.*

Years.	Average price of Gold per ounce.	Average per cent. of the value of the currency.	Average depreciation per cent.	Years.	Average price of Gold per ounce.	Average per cent. of the value of the currency.	Average depreciation per cent.
	L. s. d.	L. s. d.	L. s. d.		L. s. d.	L. s. d.	L. s. d.
1800	3 17 10½	100 0 0	Nil.	1811	4 4 6	92 3 2	7 16 10
1801	4 5 0	91 12 4	8 7 8	1812	4 15 6	79 5 3	20 14 9
1802	4 4 0	92 14 2	7 5 10	1813	5 1 0	77 2 0	22 18 0
1803	4 0 0	97 6 10	2 13 2	1814	5 4 0	74 17 6	25 2 6
1804	4 0 0	97 6 10	2 13 2	1815	4 13 6	83 5 9	16 14 3
1805	4 0 0	97 6 10	2 13 2	1816	4 13 6	83 5 9	16 14 3
1806	4 0 0	97 6 10	2 13 2	1817	4 0 0	97 6 10	2 13 2
1807	4 0 0	97 6 10	2 13 2	1818	4 0 0	97 6 10	2 13 2
1808	4 0 0	97 6 10	2 13 2	1819	4 1 6	95 11 0	4 9 0
1809	4 0 0	97 6 10	2 13 2	1820	3 19 11	97 8 0	2 12 0
1810	4 10 0	86 10 6	13 9 6	1821	3 17 10½	100 0 0	Nil.

Tables. **No. VI.—Gold Coins of Different Countries.**—*A Table containing the Assays, Weights, and Values of the principal Gold Coins of all Countries, computed according to the Mint Price of Gold in England, and from Assays made both at London and Paris, which have been found to verify each other.*[1] Tables.

N.B. The Publishers of this Work have purchased, at a very considerable expense, the right to publish this Table from the Proprietors of the Second Edition of Dr. Kelly's *Cambist*, where it originally appeared.

		Assay.	Weight.	Standard Weight.	Contents in pure gold.	Value in Sterling.
		car. gr.	*dwt. gr.*	*dwt. gr. mi.*	*grains.*	*s. d.*
Austrian Dominions	Souverain	W. 0 $0\frac{1}{4}$	3 14	3 13 15	78·6	13 10·92
	Double Ducat	B. 1 $2\frac{3}{4}$	4 12	4 20 5	106·4	18 9·97
	Ducat Kremnitz, or Hungarian	B. 1 3	2 $5\frac{3}{4}$	2 10 3	53·3	9 5·91
Bavaria	Carolin	W. 3 2	6 $5\frac{1}{4}$	5 5 10	115	20 4·23
	Max d'or, or Maximilian	W. 3 $2\frac{1}{4}$	4 4	3 14 0	77	13 7·44
	Ducat	B. 1 $2\frac{1}{4}$	2 $5\frac{3}{4}$	2 19 11	52·8	9 4·12
Bern	Ducat (double, &c. in proportion)	B. 1 $1\frac{3}{4}$	1 23	2 2 1	45·9	8 1·48
	Pistole	W. 0 $1\frac{1}{2}$	4 21	4 19 0	105·5	18 7·86
Brunswick	Pistole (double in proportion)	W. 0 $1\frac{1}{2}$	4 $21\frac{1}{4}$	4 19 5	105·7	18 8·48
	Ducat	B. 1 $0\frac{1}{2}$	2 $5\frac{3}{4}$	2 8 9	51·8	9 2
Cologne	Ducat	B. 1 2	2 $5\frac{3}{4}$	2 9 8	52·6	9 3·70
Denmark	Ducat current	W. 0 $3\frac{3}{4}$	2 0	1 21 19	42·2	7 5·62
	Ducat specie	B. 1 2	2 $5\frac{3}{4}$	2 9 8	52·6	9 3·70
	Christian d'or	W. 0 1	4 7	4 5 16	93·3	16 6·14
England	Guinea	Stand.	5 $9\frac{1}{2}$	5 9 10	118·7	21 0
	Half Guinea	Stand.	2 $16\frac{3}{4}$	2 16 15	59·3	10 6
	Seven Shilling Piece	Stand.	1 19	1 19 0	39·6	7 0
	Sovereign	Stand.	5 $3\frac{1}{4}$	5 3 5	113·1	20 0
France	Double Louis (coined before 1786)	W. 0 2	10 11	10 5 6	224·9	39 9·64
	Louis	W. 0 2	5 $5\frac{1}{2}$	5 2 12	112·4	19 10·71
	Double Louis (coined since 1786)	W. 0 $1\frac{1}{2}$	9 20	9 15 19	212·6	37 7·53
	Louis	W. 0 $1\frac{1}{2}$	4 22	4 19 19	106·3	18 9·75
	Double Napoleon, or piece of 40 francs	W. 0 $1\frac{3}{4}$	8 7	8 3 0	179	31 8·36
	Napoleon, or piece of 20 francs	W. 0 $1\frac{3}{4}$	4 $3\frac{1}{2}$	4 1 10	89·7	15 10·5
	New Louis (double, &c.) the same as the Napoleon					
Francfort-on-the-Maine	Ducat	B. 1 $2\frac{1}{2}$	2 $5\frac{3}{4}$	2 9 14	52·9	9 4·34
Geneva	Pistole, old	W. 0 2	4 $7\frac{1}{4}$	4 4 18	92·5	16 4·45
	Pistole, new	W. 0 $0\frac{1}{2}$	3 $15\frac{3}{4}$	3 15 4	80	14 1·9
Genoa	Sequin	B. 1 $3\frac{1}{2}$	2 $5\frac{3}{4}$	2 10 6	53·4	9 5·41
Hamburgh	Ducat (double in proportion)	B. 1 $2\frac{1}{2}$	2 $5\frac{3}{4}$	2 9 14	52·9	9 4·35
Hanover	George d'or	W. 0 $1\frac{1}{4}$	4 $6\frac{1}{2}$	4 5 3	92·6	16 4·66
	Ducat	B. 1 $3\frac{1}{4}$	2 $5\frac{3}{4}$	2 10 3	53·3	9 5·19
	Gold Florin (double in proportion)	W. 3 $0\frac{1}{2}$	2 2	1 18 6	39	6 10·83
Holland	Double Ryder	Stand.	12 21	12 21 0	283·2	50 1·46
	Ryder	Stand.	6 9	6 9 0	140·2	24 9·75
	Ducat	B. 1 $2\frac{1}{4}$	2 $5\frac{3}{4}$	2 9 12	52·8	9 4·13
Malta	Double Louis	W. 1 $3\frac{1}{4}$	10 16	9 18 18	215·3	38 1·25
	Louis	W. 1 3	5 8	4 21 16	108	19 1·37
	Demi Louis	W. 1 $2\frac{1}{4}$	2 16	2 11 3	54·5	9 7·75
Milan	Sequin	B. 1 3	2 $5\frac{3}{4}$	2 10 0	53·2	9 4·98
	Doppia or Pistole	W. 0 1	4 $1\frac{1}{2}$	4 0 8	88·4	15 7·74
	Forty Lire piece of 1808	W. 0 $1\frac{3}{4}$	8 8	8 4 0	179·7	31 9·64
Naples	Six Ducat piece of 1783	W. 0 $2\frac{1}{4}$	5 16	5 12 18	121·9	21 6·89
	Two Ducat piece, or Sequin, of 1762	W. 1 $2\frac{3}{4}$	1 $20\frac{1}{4}$	1 16 6	37·4	6 7·42
	Three Ducat piece, or Oncetta, of 1818	B. 1 $3\frac{1}{2}$	2 $10\frac{1}{4}$	2 15 1	58·1	10 3·40
Netherlands	Gold Lion, or fourteen florin piece	Stand.	5 $7\frac{3}{4}$	5 7 16	117·1	20 8·69
	Ten florin piece (1820)	W. 0 $1\frac{3}{4}$	4 $7\frac{3}{4}$	4 5 15	93·2	16 5·93

[1] The London Assays in this Table have been made by Robert Bingley, Esq., the King's Assay Master of the Mint, and those at Paris by Pierre Frederic Bonneville, Essayeur du Commerce, as published in his elaborate work on the coins of all nations.

Specimens of all the foreign coins brought to London for commercial purposes have been supplied for this Table from the Bullion Office, Bank of England, by order of the Bank Directors, and have been selected by John Humble, Esq., the chief of that office, who also examined the Tables in their progress. It may likewise be added, that the Mint Reports of these commercial coins are chiefly from average assays; and that all the computations have been carefully verified by different calculators. (Note by Dr. Kelly to the second edition of the *Cambist*, published in 1821.)

Tables.

		Assay.		Weight.		Standard weight.			Contents in pure gold.	Value in Sterling.	
		car.	gr.	dwt.	gr.	dwt.	gr.	mi.	grains.	s.	d.
PARMA	Quadruple Pistole (double in prop.)	W. 1	0	18	9	17	12	18	386	68	3·78
	Pistole or Doppia of 1787	W. 0	3	4	14	4	10	4	97·4	17	2·85
	Ditto of 1796	W. 1	0¼	4	14	4	8	14	95·9	16	11·67
	Maria Theresa (1818)	W. 0	1¾	4	3½	4	1	10	89·7	15	10·5
PIEDMONT	Pistole coined since 1785 (½, &c. in prop)	W. 0	1¼	5	20	5	17	0	125·6	22	2·75
	Sequin (½ in proportion)	B. 1	2½	2	5¾	2	9	12	52·9	9	4·34
	Carlino, coined since 1785 (½, &c., in proportion)	W. 0	1¼	29	6	28	20	0	634·4	112	3·33
	Piece of 20 francs, called Marengo	W. 2	0	4	3¼	3	18	4	82·7	14	7·63
POLAND	Ducat	B. 1	2½	2	5¾	2	9	12	52·9	9	4·34
PORTUGAL	Dobraon of 24,000 rees	Stand.		34	12	34	12	0	759	134	3·96
	Dobra of 12,800 rees	Stand.		18	6	18	6	0	401·5	71	0·70
	Moidore or lisbonine, (½, &c. in prop.)	Stand.		6	22	6	22	0	152·2	26	11·24
	Piece of 16 testoons, or 1600 rees	W. 0	0⅝	2	6	2	5	14	49·3	8	8·70
	Old Crusado of 400 rees	W. 0	0½	0	15	0	14	18	13·6	2	4·88
	New Crusado of 480 rees	W. 0	0⅝	0	16¼	0	16	2	14·8	2	7·43
	Milree, (coined for African cols. 1755)	Stand.		0	19¾	0	19	15	18·1	3	2·44
PRUSSIA	Ducat of 1748	B. 1	2½	2	5¾	2	9	14	52·9	9	4·34
	Ducat of 1787	B. 1	2	2	5¾	2	9	6	52·6	9	3·71
	Frederick (double) of 1769	W. 0	1¾	8	14	8	9	18	185	32	8·90
	Frederick (single) of 1778	W. 0	1½	4	7	4	5	4	92·8	16	5·08
	Frederick (double) of 1800	W. 0	2	8	14	8	9	6	184·5	32	7·84
	Frederick (single) of 1800	W. 0	2	4	7	4	4	13	92·2	16	3·42
ROME	Sequin (coined since 1760)	B. 1	3½	2	4½	2	9	0	52·2	9	2·86
	Scudo of the Republic	W. 0	1¾	17	0¼	16	16	6	367	64	11·43
RUSSIA	Ducat of 1796	B. 1	2½	2	6	2	10	0	53·2	9	4·98
	Ducat of 1763	B. 1	2	2	5¾	2	9	8	52·6	9	3·71
	Gold ruble of 1756	Stand.		1	0½	1	0	10	22·5	3	11·78
	Ditto of 1799	W. 0	0¼	0	18¾	0	18	14	17·1	3	0·31
	Gold Poltin of 1777	Stand.		0	9	0	9	0	8·2	1	5·41
	Imperial of 1801	B. 1	2¼	7	17¼	8	6	8	181·9	32	2·31
	Half Imperial of 1801	B. 1	2¼	3	20½	4	3	4	90·9	16	1·05
	Ditto of 1818	B. 0	0⅛	4	3½	4	3	12	91·3	16	1·98
SARDINIA	Carlino (½ in proportion)	W. 0	2¾	10	7½	9	23	16	219·8	30	8·10
SAXONY	Ducat of 1784	B. 1	2	2	5¾	2	9	8	52·6	9	3·71
	Ducat of 1797	B. 1	2½	2	5¾	2	9	14	52·9	9	4·34
	Augustus of 1754	W. 0	2⅝	4	6½	4	3	8	91·2	16	1·69
	Augustus of 1784	W. 0	1¾	4	6½	4	4	12	92·2	16	3·81
SICILY[1]	Ounce of 1751	W. 1	2½	2	20½	2	15	8	58·2	10	3·60
	Double Ounce of 1758	W. 1	2	5	17	5	7	14	117	20	8·48
SPAIN	Doubloon of 1772 (double and single in proportion)	W. 0	2¼	17	8½	61	21	16	372	65	10·05
	Quadruple Pistole of 1801	W. 1	1	17	9	16	9	6	360·5	63	9·62
	Pistole of 1801	W. 1	1	4	8¼	4	2	6	90·1	15	11·35
	Coronilla, gold dol. or vintem of 1801	W. 1	2½	1	3	1	0	18	22·8	4	0·42
SWEDEN	Ducat	B. 1	2	2	5	2	8	12	51·9	9	2·22
SWITZERLAND	Pistole of the Helvetic Repub. of 1800	W. 0	1½	4	21½	4	19	9	105·9	18	8·91
TREVES	Ducat	B. 1	2	2	5¾	2	9	8	52·6	9	3·71
TURKEY	Sequin fonducli of Constantinop. of 1773	W. 2	2½	2	5¾	1	23	6	43.3	7	7·94
	Sequin fonducli of 1789	W. 2	3¼	2	5¾	1	22	16	42.9	7	7·11
	Half misseir (1818)	W. 5	3½	0	18¼	0	13	5	12·16	2	1·82
	Sequin fonducli	W. 2	3	2	5	1	22	7	42·5	7	6·26
	Yermeebeshlek	B. 0	3½	2	1¾	3	4	13	70·3	12	5·30
TUSCANY	Zecchino or sequin	B. 1	3¾	3	5¾	2	10	14	53·6	9	5·83
	Ruspone of the kingdom of Etruria	B. 1	3⅞	6	17¼	7	7	13	161	28	5·93
UNITED STATES.[2]	Eagle (½ and ¼ in proportion)	W. 0	0½	11	6	11	4	8	246·1	43	6·66
VENICE	Zecchino or sequin (½ and ¼ in prop.)	B. 1	3¼	2	6	2	10	10	53·6	9	5·83
WIRTEMBERG	Carolin	W. 3	2	6	3½	5	4	0	113·7	20	1·47
	Ducat	B. 1	2	2	5	2	8	12	51·9	9	2·22
ZURICH,	Ducat (double and ½ ducat in prop.)	B. 1	2	2	5¾	2	9	8	52·6	9	3·71
	EAST INDIES.										
EAST INDIA	Rupee, Bomba y (1818)	B. 0	0½	7	11	7	11	13	164·7	29	1·78
	Rupee of Madras (1818)	Stand.		7	12	7	12	0	165	29	2·42
	Pagoda, Star	W. 3	0	2	4¾	1	21	11	41·8	7	4·77

[1] Much variation is found in the fineness of the Sicilian gold coins.

[2] This value of the American Eagle is taken from average assays of the coins of twelve years.

Tables. No. VII.—Silver Coins of different Countries.—*A Table containing the Assays, Weights, and Values of the principal Silver Coins of all Countries, computed at the rate of 5s. 2d. per Ounce Standard, from Assays made both at the London and Paris Mints.* Tables.

		Assay.	Weight.	Standard Weight.	Contents in pure silver.	Value in Sterling.
		oz. dwt.	*dwt. gr.*	*dwt. gr. mi.*	*grains.*	*s. d.*
Austria	Rixdollar of Francis II., 1800	W. 1 5	18 1	16 0 4	355·5	4 1·64
	Rixdollar of the kingdom of Hungary	W. 1 2	18 1	16 6 1	360·9	4 2·39
	Half rixdollar or florin, *Convention*	W. 1 3	9 0½	8 2 1	179·6	2 1·07
	Copftsuck, or 20 creutzer piece	W. 4 3	4 6½	2 16 3	59·4	0 8·29
	17 Creutzer piece	W. 4 8	4 0	2 9 18	53·5	0 7·47
	Halbe copf, or 10 creutzer piece	W. 5 5	2 11	1 7 1	28·8	0 4·01
Baden	Rixdollar	W. 1 4	18 2	16 3 1	358·1	4 2
Bavaria	Rixdollar of 1800 (½ in proportion)	W. 1 4½	17 12	15 13 13	345·6	4 0·25
	Copftsuck	W. 4 3	4 6½	2 16 3	59·4	0 8·29
Bern	Patagon or crown (½ in proportion)	W. 0 7	18 22	18 7 14	406·7	4 8·79
	Piece of 10 Batzen	W. 1 2	5 3	4 14 17	102·5	1 2·31
Bremen	Piece of 48 Grotes	W. 2 2	11 0	8 22 1	198	2 3·64
Brunswick	Rixdollar, *Convention*	W. 1 3	18 1	16 4 4	359·2	4 2·15
	Half rixdollar	W. 1 3	9 0½	8 2 2	179·6	2 1·07
	Gulden, or piece of ⅔, fine, of 1764	B. 0 16	8 10½	9 1 1	200·8	2 4·03
	Gulden, common, of 1764	W. 1 2	9 0	8 2 10	180	2 1·13
	Gulden, ditto, of 1795	W. 2 2	11 1½	8 23 7	199·1	2 3·80
	Half Gulden, or piece of ⅓, of 1764	W. 1 2	4 12	4 1 5	90	1 0·56
Denmark	Ryksdaler, specie, of 1798	W. 0 13	18 14	17 11 17	388·4	4 6·23
	New piece of 4 marks	W. 0 12	12 9	11 16 14	259·8	3 0·27
	Half ryksdaler	W. 0 13	9 7	8 17 8	194·2	2 3·11
	Mark, specie, or ⅙ ryksdaler	W. 3 1	4 0	2 21 12	64·4	0 7·59
	Rixdollar, specie, of Sleswig and Holstein (pieces of ⅔ and ⅓ in prop.)	W. 0 12	18 13	17 12 6	389.4	4 6·37
	Piece of 24 skillings	W. 4 7	5 2½	3 2 10	68·9	0 ·9·62
England	Crown (*old*)	Stand.	19 8½	19 8 10	429·7	5 0
	Half-crown	Stand.	9 16¼	9 16 5	214·8	2 6
	Shilling	Stand.	3 21	3 21 0	85·9	1 0
	Sixpence	Stand.	1 22½	1 22 10	42·9	0 6
	Crown (*new*)	Stand.	18 4¼	18 4 7	403·6	4 8·36
	Half-crown	Stand.	9 2	9 2 4	201·8	2 4·18
	Shilling	Stand.	3 15¼	3 15 6	80·7	0 11·27
	Sixpence	Stand.	1 19¾	1 19 14	40·3	0 5·63
France	Ecu of 6 livres	W. 0 7	18 18	18 7 16	403·1	4 8·28
	Demi ecu	W. 0 7	9 9	9 1 18	201·5	2 4·13
	Piece of 24 sous (divisions in proportion)	W. 0 7	3 20	3 16 19	83·4	0 11·64
	Piece of 30 sous (½ in proportion)	W. 3 8	6 12	4 12 4	100·2	1 1·99
	Piece of 5 francs of the Convention	W. 0 10½	16 0	15 5 14	338·3	3 11·24
	Piece of 5 francs (Napoleon) of 1808	W. 0 7	16 1	15 12 4	344·9	4 0·16
	Piece of 2 francs of 1808	W. 0 7	6 11	6 6 2	138·8	1 7·38
	Franc of 1809	W. 0 7	3 5½	3 3 1	69 4	0 9·69
	Demi franc	W. 0 8½	1 15	4 13 6	34·7	0 4·84
	Franc (Louis) of 1818, same as franc of 1809					
Geneva	Patagon	W. 1 0	17 9	15 19 8	351	4 1·03
	Piece of 15 sous of 1794	W. 2 6	2 1¼	1 15 1	36·1	0 5·04
Genoa	Scudo, of 8 lire, of 1796 (½, ¼, &c. in proportion)	W. 0 8	21 9	20 14 10	457·4	5 3·87
	Scudo of the Ligurian Republic	W. 0 9½	21 9	20 11 2	454·3	5 3·43
Hamburgh	Rixdollar, specie	W. 0 10	18 18	17 21 12	397·5	4 7·49
	Double mark, or 32 schillings piece (single in proportion)	W. 2 3	11 18	9 11 8	210·3	2 5·36
	Piece of 8 schillings	W. 3 12	3 8¼	2 6 4	50·1	0 6·99
	Piece of 4 schillings	W. 4 6	2 2	1 6 12	28·3	0 3·95
Hanover	Rixdollar, *Constitution*	W. 0 9	18 19	18 0 14	400·3	4 7·89
	Florin, or piece of ⅔, fine	B. 0 16	8 10	9 0 10	200·3	2 3·96
	Half florin, or piece of ⅓, ditto	B. 0 16	4 4	4 11 4	99·2	1 1·85
	Quarter, or piece of 6 good groschen, do	B. 0 16	2 1	2 4 10	48·6	0 6·78

Tables.

		Assay.		Weight.		Standard weight.			Contents in pure silver.	Value in Sterling.	
		oz.	*dwt.*	*dwt.*	*gr.*	*dwt.*	*gr.*	*mi.*	*grains.*	*s.*	*d.*
HANOVER	Florin, or piece of $\frac{2}{3}$, base	W. 2	1	11	$0\frac{3}{4}$	8	23	15	199·6	2	3·87
HESSE CASSEL	Rixdollar, *Convention*	W. 1	6	18	1	15	22	6	353	4	1·39
	Florin, or piece of $\frac{2}{3}$ ($\frac{1}{2}$ in proportion)	W. 1	6	9	$0\frac{1}{2}$	7	23	3	176·8	2	0·68
	Thaler of 1789	W. 0	$10\frac{1}{2}$	12	$7\frac{1}{4}$	11	17	5	259·7	3	0·26
	Ecu, *Convention* (1815)	W. 1	6	17	$23\frac{3}{4}$	15	21	2	349·3	4	0·77
	Bon Gros	W. 6	14	1	4	0	11	5	10·3	0	1·43
HOLLAND	Ducatoon	B. 0	3	20	22	21	4	15	471·6	5	5·85
	Piece of 3 florins	W. 0	2	20	7	20	2	12	446·4	5	2·33
	Rixdollars (the assay varies)	W. 0	16	18	6	16	20	8	375·9	4	4·99
	Half rixdollar	W. 0	16	9	0	8	8	8	185·4	2	1·89
	Florin or guilder ($\frac{1}{2}$ in proportion)	W. 0	$4\frac{1}{2}$	6	18	6	14	14	146·8	1	8·49
	12 Stiver piece	W. 0	$16\frac{1}{2}$	4	12	4	3	18	92·4	1	0·90
	Florin of Batavia	W. 0	$5\frac{1}{2}$	6	13	6	9	2	141·6	1	7·77
	Rixdollar, or 50 stiver piece of the kingdom of Holland	W. 0	$5\frac{1}{2}$	17	0	16	13	18	367·9	4	3·37
LUBEC	Rixdollar, specie	W. 0	13	18	18	17	15	12	391·9	4	6·72
	Double mark	W. 2	3	11	18	9	11	8	210·3	2	5·36
	Mark	W. 2	3	5	21	4	17	14	105·1	1	2·67
LUCCA	Scudo	W. 0	3	17	0	16	18	10	372·3	4	3·98
	Barbone	W. 3	3	1	$20\frac{1}{4}$	1	7	14	29·3	0	4·09
MALTA	Ounce of 30 tari of Emmanuel Pinto	W. 2	5	19	$1\frac{1}{2}$	15	4	14	337·4	3	11·11
	2 Tari piece	W. 2	19	1	2	0	19	2	17·7	0	2·47
MILAN	Scudo of 6 lire ($\frac{1}{2}$ in proportion)	W. 0	7	14	$20\frac{3}{4}$	14	9	10	319·6	3	8·62
	Lira, new	W. 4	10	4	0	2	9	0	52·8	0	7·37
	Lira, old	W. 0	3	2	10	2	9	4	52·9	0	7·38
	Scudo of the Cisalpine Republic	W. 0	7	14	$21\frac{1}{2}$	14	10	4	320·2	3	8·71
	Piece of 30 soldi of ditto	W. 2	18	4	17	3	11	8	77·2	0	10·78
MODENA	Scudo of 15 lire, 1739 (double, &c. in proportion)	W. 0	14	18	$12\frac{1}{2}$	17	8	9	385·2	4	5·78
	Scudo of 5 lire, of 1782	W. 0	3	5	19	5	17	2	126·8	1	5·70
	Scudo of 1796	W. 3	3	18	$1\frac{3}{4}$	12	22	12	287·4	3	4·13
NAPLES	Ducat, new ($\frac{1}{2}$ in proportion)	W. 1	0	14	15	13	7	8	295·4	3	5·24
	Piece of 12 Carlini of 1791	W. 1	0	17	15	16	0	18	356·	4	1·71
	Ditto of 1796	W. 1	2	17	$16\frac{3}{4}$	15	22	12	353·9	4	1·41
	Ditto of 1805 ($\frac{1}{2}$ in proportion)	W. 1	2	17	$18\frac{1}{4}$	15	23	18	355·2	4	1·60
	Ditto of 10 Carlini (1818)	W. 1	2	14	18	13	7	0	295·1	3	5·20
NETHERLANDS	Ducatoon, old	B. 0	4	21	0	21	9	0	474·6	5	6·27
	Ducatoon of Maria Theresa	W. 0	14	21	10	20	1	12	445·5	5	2·20
	Crown, ($\frac{1}{2}$, &c. in proportion)	W. 0	14	19	0	17	19	4	395·2	4	7·18
	5 Stiver piece	W. 6	3	3	4	1	9	18	31·3	0	4·37
	Florin of 1790	W. 0	14	5	$23\frac{1}{2}$	5	14	9	124·3	1	5·35
	Florin of 1816	W. 0	$7\frac{1}{2}$	6	22	6	16	6	148.4	1	8·72
	Half florin (with divisions in prop.)	W. 4	$5\frac{1}{2}$	5	11	3	9	2	75	0	10·46
PARMA	Ducat of 1784	W. 0	9	16	11	15	18	18	350·6	4	0·95
	Ducat of 1796, ($\frac{1}{2}$ in proportion)	W. 0	$5\frac{1}{2}$	16	$12\frac{3}{4}$	16	2	18	357·9	4	1·97
	Piece of 3 lire	W. 1	4	4	14	4	2	2	90·7	1	0·66
PIEDMONT	Scudo (1755) $\frac{1}{2}$, &c. in proportion	W. 0	$5\frac{1}{2}$	22	14	22	0	10	488·9	5	8·26
	Scudo (1770) $\frac{1}{2}$ and $\frac{1}{4}$ in proportion	W. 0	5	22	14	22	1	16	490·0	5	8·42
	Piece of 2 lire (1714)	W. 0	$4\frac{1}{2}$	7	$20\frac{1}{2}$	7	16	13	170·8	1	11·85
	5 franc piece (1801)	W. 0	8	16	$1\frac{1}{2}$	15	11	12	343·7	3	11·99
POLAND	Rixdollar, old	W. 1	2	18	1	16	6	0	360·8	4	2·38
	Rixdollar, new (1794)	W. 2	17	15	$10\frac{1}{2}$	11	11	6	254·3	2	11·51
	Florin, or gulden	W. 4	2	6	0	3	18	16	84	0	11·72
PORTUGAL	New crusado (1690)	W. 0	4	11	0	10	19	0	239·2	2	9.40
	Ditto (1718)	W. 0	$6\frac{1}{2}$	9	8	9	1	0	200·2	2	3·95
	Ditto (1795)	W. 0	7	9	9	9	1	18	201·6	2	4·15
	Doze vintems, or piece of 240 rees (1799)	W. 0	7	4	16	4	12	10	100·4	1	2·01
	Testoon (1799)	W. 0	7	2	$0\frac{1}{2}$	1	22	18	43·4	0	6·06
	New crusado (1809)	W. 0	4	9	3	8	23	0	198·2	2	4·67
	Seis vintems, or piece of 120 rees (1802)	W. 0	9	2	$4\frac{1}{2}$	2	2	8	46·6	0	6.50
	Testoon (1802)	W. 0	9	2	0	1	22	0	42·5	0	5·93
	Tres vintems, or piece of 60 rees (1802)	W. 0	9	1	$2\frac{1}{4}$	1	1	4	23·3	0	3·25
	Half testoon (1802)	W. 0	9	0	23	0	22	0	20·4	0	2·84

Tables.

		Assay.	Weight.	Standard Weight.	Contents in pure silver.	Value in Sterling.
		oz. dwt.	*dwt. gr.*	*dwt. gr. mi.*	*grains.*	*s. d.*
Portuguese Colonies.	Piece of 8 macutes, of Portuguese Africa	W. 0 9	7 12	7 4 14	159·8	1 10·31
	Ditto of 6 ditto	W. 0 9	5 13	5 7 12	118	1 4·47
	Ditto of 4 ditto	W. 0 9	3 16	3 12 8	78·1	0 10·90
Prussia[1]	Rixdollar, Prussian currency ($\frac{1}{2}$ in prop.)	W. 2 5	14 $6\frac{1}{2}$	11 9 0	252·6	2 11·27
	Rixdollar, *Convention*	W. 1 3	18 1	16 4 2	359	4 2·13
	Florin, or piece of $\frac{2}{3}$	W. 2 3	11 2	8 22 8	198·4	2 3·70
	Florin of Silesia	W. 2 2	9 11	7 16 0	170·3	1 11·78
	Drittel, or piece of 8 good groschen.	W. 3 3	5 $8\frac{3}{4}$	3 20 4	85·3	0 11·91
	Piece of 6 groschen	W. 2 8	3 14	2 19 6	62·3	0 8·69
Rome	Scudo, or crown (coined since 1753)	W. 0 4	17 1	16 17 13	371·5	4 3·87
	Mezzo scudo, or half-crown	W. 0 4	8 $12\frac{1}{2}$	8 8 16	185·7	2 1·93
	Testone (1785)	W. 0 5	5 2	4 23 4	110·3	1 3·40
	Paolo (1785)	W. 0 4	1 17	1 16 4	37·2	0 5·19
	Grosso, or half paolo (1785)	W. 0 5	0 $20\frac{1}{2}$	0 20 0	18·5	0 2·58
	Scudo of the Roman Republic (1799)	W. 0 6	17 1	16 13 18	368·1	4 3·40
Russia	Ruble of Peter the Great	W. 2 7	18 1	14 1 8	312·1	3 7·58
	Ditto of Catherine I. (1725)	W. 2 $4\frac{1}{2}$	17 11	13 23 0	309·9	3 7·27
	Ditto of Peter II. (1727)	W. 2 12	18 $5\frac{3}{4}$	13 23 4	310·	3 7·28
	Ditto of Anne (1734)	W. 1 11	16 $14\frac{1}{2}$	14 6 16	317·2	3 8·29
	Ditto of Elizabeth (1750)	W. 1 7	16 12	14 11 16	321·8	3 8·93
	Ditto of Peter III. (1762)	W. 2 2	15 10	12 12 0	277·5	3 2·75
	Ditto of Catherine II. (1780)	W. 2 4	15 12	12 10 6	275·9	3 2·52
	Ditto of Paul (1799)	W. 0 14	13 12	12 15 10	280·8	3 3·21
	Ditto of Alexander (1802)	W. 0 13	13 $1\frac{1}{2}$	17 7 2	273·	3 2·12
	Ditto of ditto (1805)	W. 0 16	13 12	12 12 12	278·1	3 2·83
	20 Copek piece (1767	W. 2 2	3 $10\frac{3}{4}$	2 19 0	62·6	0 8·74
	Ditto (1784)	W. 2 2	3 3	2 12 18	56·2	0 7·84
	15 Copeck piece (1778)	W. 2 2	2 6	1 19 18	40·5	0 5·65
	10 Copeck piece	W. 2 6	2 1	1 14 16	35.9	0 5·11
	Ditto (1798)	W. 0 $14\frac{1}{2}$	1 9	1 6 16	28·5	0 3·97
	Ditto (1802)	W. 0 13	1 $8\frac{1}{2}$	1 6 11	28·3	0 3·95
	5 Copeck piece (1801)	W. 0 $13\frac{1}{2}$	0 $16\frac{1}{2}$	0 15 10	15·3	0 2·13
Sardinia	Scudo, or crown ($\frac{1}{2}$ and $\frac{1}{4}$ in prop.)	W. 0 7	15 $2\frac{1}{2}$	14 15 0	324·7	3 9·34
Saxony	Rixdollar, *Convention* ($\frac{1}{2}$ and $\frac{1}{4}$ in prop.)	W. 1 3	18 0	16 3 4	358·2	4 2·01
	Piece of 16 groschen of Leipsic	W. 2 2	9 $9\frac{1}{2}$	7 4 16	169·1	1 11·61
	Rixdollar current of Saxe Gotha	W. 4 $4\frac{1}{2}$	18 1	11 4 2	248·1	2 10·64
	$\frac{1}{6}$Thaler of 1804	W. 4 11	3 11	2 0 19	45·3	0 6·32
	Ditto of 1808	W. 4 $11\frac{1}{2}$	3 $5\frac{1}{2}$	1 21 8	42·1	0 5·87
	Ditto of Jerome Bonaparte of 1809	W. 5 4	3 17	1 23 6	43·7	0 6·10
Sicily	Scudo ($\frac{1}{2}$ in proportion)	W. 1 4	17 14	15 16 6	348·2	4 0·62
	Piece of 40 grains	W. 1 2	5 21	5 7 2	117·5	1 4·40
Spain	Dollar,[2] of late coinage	W. 0 8	17 8	16 17 0	370·9	4 3·79
	Half dollar, ditto	W. 0 8	8 16	8 8 10	185·4	2 1·88
	Mexican peceta (1774)	W. 0 8	4 $7\frac{1}{2}$	4 3 16	92·3	1 0·88
	Real of Mexican plate (1775)	W. 0 8	2 $3\frac{3}{4}$	2 1 20	46·1	0 6·43
	Peceta provincial of 2 reals of new plate (1775)	W. 1 $9\frac{1}{2}$	3 18	3 6 0	72·2	0 10·08
	Real of new plate (1795)	W. 1 $9\frac{1}{2}$	1 21	1 15 0	36·1	0 5·04
Sweden	Rixdollar (1762)	W. 0 12	18 20	17 19 10	395·5	4 7·22
	Rixdollar of late coinage	W. 0 $14\frac{1}{3}$	18 17	17 12 0	388·5	4 6·28
Switzerland	Ecu or rixdollar of Lucerne, $\frac{1}{2}$, &c. in proportion (1715)	W. 0 $14\frac{1}{2}$	17 $8\frac{1}{2}$	16 5 8	360·1	4 2·28
	Old gulden, or florin of Lucerne (1714)	W. 1 19	8 $14\frac{1}{2}$	7 2 8	157 5	1 9·99
	Ecu of 40 batzen of Lucerne (1796)	W. 0 5	19 0	18 13 14	412·3	4 9·57
	Half ditto	W. 1 2	9 20	8 20 12	196·7	2 3·46
	Florin, or piece of 40 schillings of Lucerne (1793)	W. 1 5	4 22	4 8 14	96·8	1 1·51
	Ecu of 40 batzen of the Helvetic Republic (1798) $\frac{1}{2}$ in proprtion.	W. 0 6	18 23	18 10 14	409·5	4 9·18
	Ecu of 4 Franken (1801)	W. 0 7	18 23	18 8 12	407·6	4 9·18

[1] The Prussian coins, having been debased at different periods, vary in their reports.
[2] This is the coin which is universally circulated under the name of the Spanish dollar.

Tables.

		Assay.	Weight.	Standard Weight.	Contents in pure silver.	Value in Sterling.
		oz. dwt.	*dwt. gr.*	*dwt. gr. mi.*	*grains.*	*s. d.*
Turkey	Piastre of Selim of 1801	W. 5 6	8 6	4 7 8	95·7	1 1·36
	Piastre of Crim Tartary (1778)	W. 6 13	10 5	4 2 4	90·9	1 0·69
	Piastre of Tunis (1787)	W. 6 5½	10 0	4 8 6	96·5	1 1·47
	Piastre (1818)	W. 5 14	6 6½	3 1 4	67·7	0 9·45
Tuscany	Piece of 10 paoli of the kingdom of Etruria (1801)	W. 0 4	17 13½	17 5 18	382·9	4 5·46
	Scudo pisa of ditto (1803)	W. 0 2	17 12	17 8 4	385·0	4 5·76
	Piece of 10 lire ditto (1803)	B. 0 7	25 6	26 1 12	578·7	6 8·80
	Lira (1803)	B. 0 7	2 8	2 9 16	53·4	0 7.45
United States.	[1]Dollar (1795) ½, &c. in proportion	W. 0 6½	17 8	16 19 16	373·5	4 4·15
	Dollar (1798)	W. 0 7	17 10½	16 21 6	374·9	4 4·35
	Dollar (1802)	W. 0 10½	17 10	16 14 0	368·3	4 3·42
	Dollar, an average of 8 years	W. 0 8½	17 8	16 16 0	370·1	4 3·68
	Dime, or one-tenth dollar (1796)	W. 0 4	1 19½	1 18 14	39·5	0 5.71
	Half dime (1796)	W. 0 7	0 21¾	0 21 0	19·5	0 2·72
Venice	Piece of 2 lire, or 24 creutzers (1800)	W. 8 4½	5 19½	1 12 2	33·4	0 4·66
	Ditto of 2 lire, called moneta provinciale (1808)	W. 8 3	5 13½	1 11 8	32·8	0 4·58
	Ditto of 2 lire (1802) ½ and ¼ in prop.	W. 8 4	5 6¼	1 8 19	30·5	0 4·25
Wirtemberg.	Rixdollar, specie	W. 1 3	18 1	16 14 2	359·1	4 2·14
	Copftsuck	W. 4 2	4 16½	2 16 12	59·8	0 8.35
	EAST INDIES.					
East India	Rupee of Sicca, coined by the East India Company at Calcutta	B. 0 13	7 11½	7 22 0	175·8	2 0·54
	—— Calcutta (1818)	Stand.	8 0	8 0 0	175·9	2 0·56
	—— Bombay, new, or Surat (1818)	W. 0 0¼	7 11	7 10 4	164·7	1 11·01
	Fanam, Cananore	W. 0 0¼	1 11¾	1 11 10	32.9	0 4·5
	—— Bombay, old	B. 0 13	1 11¾	1 13 16	35·	0 4·88
	—— Pondicherry	B. 0 5½	1 0½	1 1 2	22·8	0 3·18
	—— Ditto, double	W. 0 3	1 18¾	1 18 2	39·	0 5·44
	Gulden of the Dutch East India Company (1820)	W. 0 7½	6 22	6 16 6	148·4	1 8·72

No. VIII.—*Account of the Relative value of Gold and Silver in the principal Trading Places of the World, computed from the proportional Quantity of Pure Metal, in their principal Coins, and the legal or current Price of those Coins respectively. Given in by Dr. Kelly to the Committee of the House of Lords, appointed,* 1819, *to inquire into the Expediency of the Bank's resuming Cash Payments.*

	By Mint Regulations.	By Assays.	Names of the Coins from which the Proportions are taken.
England, By Old Coinage	15·2096 to 1	Proved correct by the Trials of the Pix.	Per Guinea and Old Shilling.
By New Coinage	14·2878 to 1		Per Sovereign and New Shilling.
Amsterdam	15·8735 to 1		Per 10 Guilder Piece decreed in 1816, and Silver Florin of the same date.
Hamburgh	15 to 1 nearly	14·83 to 1	Per Ducato reckoned at 6 Marks Banco and Rixdollar.
Paris	15·5 to 1	15·5 to 1	Per 20 Franc Piece, and 5 Franc Piece.
Madrid	16 to 1	15·85 / 16·46 to 1	Per Doubloon and Dollar of different Coinages.
Lisbon	13·56 to 1	13·33 to 1	Per Joannese and New Silver Crusado.
Leghorn	14·65 to 1	14·32 to 1	Per Ruspono and Francescone.
Genoa	15·34 to 1	15·35 to 1	Per Genovina and Scudo.
Naples	15·21 to 1		Per Oncetto and Ducato. (Coinage of 1818.)
Venice	15 to 1 nearly	14·35 to 1	Per Sequin and Ducat.
Petersburg	15 to 1 nearly	15·25 to 1	Per Ducat and Ruble.
United States	15 to 1	15·94 to 1	Per Eagle and Dollar.
Bengal	14·857 to 1	14·827 to 1	Per Gold Mohur and Sicca Rupee.
Madras	13·872 to 1	13·857 to 1	Per Star Pagoda and Current Rupee.
Bombay	15 to 1	15 to 1	Per Gold Rupee and Silver Rupee.
China	14·25 to 1		Per Tale of Gold, and the Average price of Spanish Dollars.

[1] The American dollars, and inferior silver pieces of late coinage, vary in fineness from W. 4 dwt. to W. 9½ dwt.

Monfalout || Monge.

MONFALOUT, or MANFALOUT, a town of Upper Egypt, situated on the left bank of the Nile, about a mile from the river, in a fertile and beautiful country. It is well built, of considerable magnitude, and carries on an extensive commerce in every species of grain. There is likewise a large manufactory of cloth here. Long. 31. 36. E. Lat. 27. 42. N.

MONFIA, one of the Querimba Islands, which are situated north from Mozambique, off the western coast of Africa. It is described as nearly 100 miles in length from north to south, but seldom more than eight or ten in breadth. It is formed of coral, and has a low, flat surface, covered with a soil remarkably productive in grain and sugar. It is partly independent, and partly subject to the imam of Muscat. Lat. 7. 30. S.

MONFLANQUIN, a city of France, in the department of the Lot and Garonne, and arrondissement of Villeneuve d'Agen. It is situated in a stony, barren district, and is ill built, but contains 698 houses and 5450 inhabitants.

MONGE, GASPAR, the inventor of descriptive geometry, and one of the founders of the Polytechnic School, was born at Beaune in 1746. His father was a dealer in small wares, who had much difficulty in supporting his family, consisting of three sons, all of whom were inclined to the sciences; but having the good sense to appreciate the importance of instruction, he employed every means in his power to procure this benefit to his children. The subject of this notice, being the eldest, received the rudiments of his education at the college of the Oratory in his native town, where he was initiated in the elements of mathematics, and whence, having completed the usual course, he was removed to a superior school at Lyons, where his precocious talents quickly developed themselves. At the age of sixteen, he was judged qualified to assist his new masters in teaching physics; and before he had completed his nineteenth year, he had been admitted into the school which had been founded at Mézières for the instruction of engineers. But this establishment was only opened to privileged scholars, twenty in number, of whom one half left, and as many joined it, every year. In order to participate in its advantages, it was essential to possess an elevated station in society; and the humble fortune of Monge was therefore a title of exclusion. He was placed as a pupil and modeller in the class, with the superintendence and direction of works in fortification; and amidst these obscure labours, where dexterity was of more importance than intelligence, the qualities of his mind remained unobserved. He was considered merely as an expert modeller, and he longed to escape from a reputation which was equally unworthy of his genius and offensive to his self-love.

Meanwhile, the commandant of the school selected him to make the practical calculations of an operation of deployment, or defiling, which had been prescribed as a task. But Monge, dissatisfied with the tentative means by which the problem was usually resolved, and impressed with the importance of signalizing the commencement of his career, imagined a more expeditious and not less certain, though far more scientific method, for attaining the result desired, by the instrumentality of geometry. His solution was contested, upon the ground that he had not made allowance for the time required to exhaust the series of calculations; but its merit was nevertheless recognised, and the capacity of the pupil strongly exemplified. The latter was then nineteen. Bossut, who professed mathematics at Mézières, now appointed Monge his assistant; and he was attached, in the same capacity, to Abbé Nollet, professor of natural philosophy, whom he soon afterwards succeeded in that chair. In this situation he made a number of curious experiments on gas, molecular attraction, and the effects of optics and electricity, as well as refined deductions on meteorology, and on the important discovery of the production of water by the combustion of inflammable air. Anticipated by Cavendish, without being aware of it, he examined this phenomenon with scrupulous attention, and assigned the share of caloric and light in its production. About the same time Monge extended and generalised his first mathematical essays, and setting out from the principle which refers to three rectangular coordinates the position of any point whatever taken in space, he made it the foundation of a new and fruitful doctrine, indispensable for all the arts of construction, and to which, when completed by successive developments, he applied the name of Descriptive Geometry. This collection of simple and uniform methods was, however, at variance with the incoherent practices which had been sanctioned by time; the attempt made by the inventor to introduce his innovations into the course of instruction in the school encountered strenuous opposition; and more than twenty years elapsed before he succeeded in obtaining the application of his geometry to the tracings of carpentry. Monge.

Monge generally passed his vacations at Paris, where he mingled in the society of men who then held the first rank in the sciences. Being already a correspondent of the Academy, to the honours of which he aspired, he found active patrons in Lavoisier, Condorcet, La Rochefoucauld, and the President Bochart de Saron; and, through the interest of D'Alembert, he was received into the Academy of Sciences in 1780. The same year he was associated with Bossut, who had been appointed to deliver the course of hydrodynamics established at the Louvre by Turgot. To perform these double functions, he was obliged to be alternately at Paris and at Mézières; but the situation of examiner of the pupils of the naval school, to which he was appointed after the death of Bezout in 1783, withdrew him from Mézières, where he had laid the foundation of his fame, and initiated in the sciences such men as Meusnier, Tinseau, Carnot, Coulomb, and others scarcely inferior to them. For the benefit of the naval school he composed a treatise on statics, in which he proceeded synthetically, in order to get rid of equations, and rendered the principles more accessible by relaxing the rigour of demonstration. His next appointment was that of professor of physics in the Lyceum of Paris; an institution which had for its object to disguise instruction under agreeable forms, and present it in an attractive shape to a number of indolent amateurs. To interest such frivolous auditors he would have required the peculiar talents of Fontenelle; but if he failed to impart that fascination to science which formed the distinguishing attribute of the illustrious man just named, he knew how to render his lessons attractive by piquant views and ingenious illustrations, independently of the graces of language.

Like many others, he was at first led away by the promises and hopes of the revolution. Adopting those notions of political perfectibility, which then filled all heads, he conceived that the barriers which arrested generous emulation were for ever removed, and that talents would henceforth command that distinction which of right belonged to them; but the terrible events that followed in such rapid succession in some measure dissipated this illusion, which he shared in common with so many others. Called to the ministry of marine after the 10th of August 1792, he accepted the appointment, being determined, he said, by the presence of the Prussians on the French soil; he was thus a member of the government, which then formed the ministers into one body, under the denomination of the Executive Council; and it was in this capacity that he concurred with his colleagues in causing the judgment which condemned Louis XVI. to death to be carried into execution. But he soon discovered that, amidst the exasperation of faction, his place was not tenable, and ac-

Monge.

cordingly, in the month of April 1793, he tendered his resignation, which was accepted. Some time afterwards, the committee of public safety made an appeal to the savans to assist in the defence of the French territory. Nine hundred thousand men were ready to march to the frontier to repulse the European crusade which menaced the republic; but the existing manufactories were insufficient to produce the tenth part of the *matériel* requisite for so mighty preparations. It was necessary to multiply manufactures, to describe and simplify their processes, to direct the operations of the workshops, to decompose innumerable metallic alloys for the wants of the artillery, to extract copper, to prepare steel, and to draw from the resources of the country alone a prodigious quantity of powder. The progress of the enemy required extraordinary celerity. Monge applied himself wholly to these operations, and distinguished himself by his indefatigable activity. He directed his attention to the manufacture of arms, the founderies, the boring of cannon, and the powder-mills, superintending and simplifying the various processes; he gave instructions for the preparation of saltpetre, and composed, at intervals, his *Art de fabriquer les Canons*, which was soon followed by his *Avis aux Ouvriers en Fer, sur la Fabrication de l'Acier*, containing an exposition of the means of obtaining steel by combining iron with a little charcoal.

Services so important having raised in public estimation men of science, against whom the axe of proscription was soon whetted, they obtained, after the fall of Robespierre, a tardy protection for public instruction. The Normal School was created, and a pure light diffused on the exposition of scientific truths. At length Monge published his *Géométrie Descriptive*, which he had so long kept secret, and which unquestionably forms his highest title of distinction. In explaining this collection of ingenious methods, where the modifications of extension are developed and combined by the aid of design, and where, from a sort of imitative language, are deduced, by an exact description, the truths which result from the forms of bodies and their respective positions, he dilated with pleasure on the advantages which might be derived from his work for rectifying the judgment and improving the dexterity of workmen, as well as for simplifying machines, and adding to the comforts of society. Of all the applications of which his geometry was susceptible, he has only treated of five, viz. carpentry, cutting stones, deployment, linear and aerial perspective, and the distribution of light and shadow. To him also France was, in a great measure, indebted for the establishment of the Polytechnic School; for, although Berthollet and Guyton-Morveau were associated with him in this undertaking, it was he who arranged the system of studies ultimately adopted, and which remained unaffected by the rapid mobility of the revolutionary creations. This was not only a central school, where aspirants might imbibe the general principles that connect all the branches of the public service, and establish a fraternal communication and free transmission of ideas between different classes; it was also open to all those whose scientific conceptions were calculated to improve the useful arts, to economise labour, and to enlighten industry; and although the system of instruction was perhaps too extensive and profound, there can be no doubt that it proved of immense benefit to France. From these labours Monge was called to Italy, with the sculptor Moite, the painter Barthélemy, and Berthollet, Thouin, and Labillardière, his colleagues in the Institute, to collect those masterpieces of art, the cession of which had been stipulated by the treaty of Tolentino. This mission lasted more than a year, and Monge, by his experience in mechanical processes, ably seconded the zeal of his associates for the conservation and removal of the conquered monuments.

Monge.

Having completed his labours in this department, he was charged, along with General Berthier, to lay before the Directory the treaty of Campo Formio; and, not long afterwards, he was sent to Rome, along with Daunou, there to organize a republic; an undertaking which had scarcely been completed when Bonaparte sailed for Egypt. Monge, having been ordered to join the expedition, embarked at Civita-Vecchia, along with Desaix, and, in June 1798, overtook the army at Malta. In Egypt his labours were incessant. He examined the pyramids; visited the obelisk and walls of Heliopolis; explored the antiquities scattered round Cairo and Alexandria; described the state of the Mekias, or wells constructed in the isle of Raoudah by the Kalif Almamoun, to measure the rise of the Nile; superintended the geodesical and monumental description of Egypt; and was at length appointed president of the Institute formed at Cairo upon the model of that of France. In this last capacity his exertions were prodigious. When the naval defeat of Aboukir had cut off all communication with Europe, the savans assembled at Cairo had to provide for wants still more numerous than those of France in the year 1793; as, independently of military resources, they had in fact to create the utensils necessary for the usages of life and the operations of the arts. The members of the Institute, however, divided these labours amongst them, and the attempts of individuals were guided and facilitated by the inquiries and researches of commissions formed out of the same learned body. On this trying occasion Monge and Berthollet were equally distinguished; and when a revolt broke out at Cairo, they proved that their courage and presence of mind, in the midst of danger, were not surpassed by their zeal for the advancement of science. In a journey to Suez, undertaken by Napoleon, Monge recognised the traces of the canal which by the Nile established a communication between the Red Sea and the Mediterranean; he visited the ruins of Pelusium, and, at the opening of the valley through which it is believed that the Hebrews proceeded towards Mount Sinai, he observed the fountain of Moses. He also accompanied Bonaparte to Syria, and was seized with a dangerous illness at Acre, where, in his tent, he had the affliction to receive the last sighs of his pupil, General Caffarelli.

On his return to Europe with Bonaparte, Monge became president of the Egyptian Commission, and was again placed at the head of the Polytechnic School, where he resumed his place amongst the professors, and often defended, against the prejudices of Bonaparte, the generous youth, whom the despotic instinct of that military chief had led him to dislike. On the formation of the senate, he was appointed a member of that body, with an ample provision, and the title of Count of Pelusium. The grief occasioned by the fall of Napoleon was augmented by the dissolution of the Polytechnic School, and the banishment of the surviving members of the Convention who had sent Louis XVI. to the scaffold; a measure which inferred the expatriation of M. Eschasseriaux, one of his sons-in-law. The erazure of his name from the roll of the Institute, in consequence of the expurgations of 1816, gave the last blow to his sensibility. Repeated attacks of apoplexy had already shaken his naturally robust frame, whilst the obliteration of his ideas, and all the symptoms of a rapid decline, announced his approaching dissolution. He died on the 28th of July 1818, in the seventy-second year of his age.

The separate publications of Monge are, 1. Traité Elémentaire de Statique, Paris, 1786, in 8vo; 2. Description de l'Art de fabriquer les Canons, Paris, 1795, in 4to; 3. Leçons de Géométrie Descriptive, Paris, 1813, in 8vo; 4. Application de l'Analyse à la Géométrie des Surfaces du Premier et du Deuxième Degré, Paris, 1809, in 4to. In this last work he presents the equations of lines, planes,

Monghir || Mongolia.

and curves of the second order, the theory of tangent planes, and the principal circumstances of the generation of curved surfaces, expressed by equations of partial differences, which he employs to integrate, in an elegant manner, a great number of equations, by following step by step the details of descriptive geometry. As early as the year 1772, he had shown the connection which exists between curves of double curvature, and developed surfaces. Monge likewise inserted four memoirs on pure analysis in the *Collection des Savants Etrangers de l'Académie des Sciences de Paris* (tomes vii. ix. and x.) His name also figures amongst the contributors to the *Dictionaire de Physique* of the *Encyclopédie Méthodique;* and the *Annales de Chimie* contain several memoirs written by him. For a complete list of his works, see *La France Littéraire*, art. Monge. (A.)

MONGHIR, a large district of Hindustan, in the province of Bahar, situated between the twenty-sixth and twenty-eighth degrees of north latitude. The town and fortress of Monghir is situated on the southern bank of the Ganges. It was the residence of Sultan Sujah during his government of the Bengal province, and was strengthened by him during his rebellion against his father, Shah Jehan. The fortifications have been for many years quite neglected, and the only part which remains is a small citadel, containing an arsenal and store-rooms. It is still surrounded by a wall and deep ditch, and is a place of considerable antiquity. It was an object of contention between the kings of Bahar and Bengal in the early part of the sixteenth century. In 1762 it was the residence of Cossim Aly Khan, and was taken by the British the following year. The travelling distance from Calcutta is 300 miles. Long. 86. 38. E. Lat. 25. 23. N.

MONGOLIA, an extensive tract of country in Central Asia, to the north and north-west of Asia. This vast country is not separated from the adjacent countries by any definite line of demarcation. The limits are vague, and the whole space is traversed by the nomadic tribes which, under the name of Mongols or Tartars, have had so deep a share in all the political revolutions of Asia. The various pastoral tribes which from time immemorial have been scattered over the plains of that continent, being united under Zengis Khan, extended their ravages from sea to sea, and were at one time possessed not only of the finest regions of the continent, but a great part of Europe. In later times the conquests of Timour were achieved by the same union of these tribes. The Mongol tribes are at present split into a number of petty states, dependent on the great empires of China and Russia. They still retain their roaming and pastoral habits, but since the invention of fire-arms they are no longer formidable in war. Mongolia, as far as its limits can be defined, is bounded on the east by the country of the Mantcheous, on the west by a chain of mountains continued northwards from the Beloor, and on the south by China. The whole of this country is one vast level plain, which borders on the Altai, and other mountain chains bounding Asiatic Russia on the north. This includes a considerable portion of the great desert of Shamo or Cobi, which is composed entirely of pastorage. In this country are the heads of some of the greatest rivers which water the Russian and Chinese empires, the Hoangho, the Amour, and even the Irtisch. The great disadvantage under which it labours is a scarcity of water. The Mongols, the inhabitants of this region, are of the middle size, being muscular and strongly built; they have broad, square, and flat faces, with low and flat noses; and small oblique black eyes, thick lips, a short chin, with very little beard, complete their physiognomy. Their habits are pastoral; and, like all the Tartars, they are addicted to intemperance. They are nominally subject to the empire of China; but their internal government is regulated by their native princes. The Kalkas, the Eluths, and the Buriats, with other nations of Asiatic Russia, derive their origin from the Mongols.

Monishwar || Monk.

MONISHWAR, a considerable town of Hindustan, in the province of Bejapoor, with a good market. It is thirty miles south-west from Poonah. Long. 74. 25. E. Lat. 18. 16. N.

MONJOUS, a people inhabiting the interior of Eastern Africa, in a north-easterly direction from Mozambique. They occupy a portion of that space which, in our early maps, is allotted to the empire of Monumugi. They are negroes of the ugliest description, of a deep shining black, with high cheek-bones, thick lips, and small knots of woolly hair on their heads. Their only weapons are bows and arrows, in the use of which they are dexterous. With regard to the extent of country over which they are spread, no correct estimate can be formed.

MONK anciently denoted a person who had retired from the world to give himself up wholly to God, and to live in solitude and abstinence. The word is derived from the Latin *monachus*, and that from the Greek μοναχος, solitary.

The origin of monks seems pretty well ascertained. The persecutions which attended the first ages of the Gospel forced some Christians to retire from the world, and live in deserts and places the most private and unfrequented, in hopes of finding that peace and comfort amongst beasts which were denied them amongst men; and this being the case of some very extraordinary persons, their example gave so much reputation to retirement, that the practice was continued when the reason for its commencement had ceased. After the empire became Christian, instances of this kind were numerous; and those whose security had obliged them to live separately and apart, became afterwards united into societies. We may also add, that the mystic theology, which gained ground towards the close of the third century, contributed to produce the same effect, and to drive men into solitude for the purposes of enthusiastic devotion.

The monks, at least the ancient ones, were distinguished into *solitaries*, *cœnobites*, and *sarabaites*. The *solitary* were those who lived alone, in places remote from all towns and habitations of men. The *cœnobites* were those who lived in community with several others in the same house, and under the same superiors. The *sarabaites* were strolling monks, who had no fixed rule nor residence.

The houses of monks were of two kinds, viz. *monasteries* and *lauræ*. Those whom we call monks now-a-days are cœnobites, who live together in a convent or monastery, make vows of living according to a certain rule established by the founder, and wear a habit which distinguishes their order. Those who are endowed, or have a fixed revenue, are most properly called monks, *monachi;* as the Chartreux, Benedictines, Bernardines, and others. The Mendicants, or those who beg, as the Capucins and Franciscans, are more properly called *religious* and *friars;* though the names are frequently confounded.

The first monks were those of St Anthony, who, towards the close of the fourth century, formed them into a regular body, engaged them to live in society with each other, and prescribed to them fixed rules for the direction of their conduct. These regulations, which St Anthony had framed in Egypt, were soon introduced into Palestine and Syria by his disciple Hilarion. About the same time, Aones and Eugenius, with their companions Gaddanas and Azyzas, instituted the monastic order in Mesopotamia and the adjacent countries; and their example was followed with such rapid success, that in a short time the whole of the East was filled with men, who, abandoning all human connections, advantages, pleasures, and concerns, wore out their lives amidst the hardships of want, and various kinds

Monk.

of suffering, in order to arrive at a more close and rapturous communication with God and the angels.

From the East this institution passed into the West, and first into Italy and its neighbouring islands; though it is uncertain who transplanted it thither. St Martin, the celebrated bishop of Tours, erected the first monasteries in Gaul, and recommended religious solitude with such power and efficacy, both by his instructions and his example, that his funeral is said to have been attended by no less than two thousand monks. From Gaul the monastic discipline extended itself gradually throughout the other provinces and countries of Europe. Besides the monks of St Basil and those of St Jerome, there were the hermits of St Augustin, and afterwards those of St Benedict and St Bernard, and at length came those of St Francis and St Dominic, with a legion of others.

Towards the close of the fifth century, the monks, who had formerly lived only for themselves in solitary retreats, and had never thought of assuming any rank amongst the sacerdotal order, were now gradually distinguished from the populace, and endowed with such honourable privileges that they found themselves in a condition to claim an eminent station amongst the supporters and pillars of the Christian community. The fame of their piety and sanctity was so great, that bishops and presbyters were often chosen out of their order; and the passion for erecting edifices and convents, in which the monks and holy virgins might serve God in the most commodious manner, was at this time carried beyond all bounds. The monastic orders were at first under the immediate jurisdiction of the bishops, from which they were exempted by the Roman pontiff about the end of the seventh century; and the monks, in return, devoted themselves wholly to advance the interests and to maintain the dignity of the Bishop of Rome. This immunity which they obtained was a fruitful source of licentiousness and disorder, and occasioned the greater part of the vices with which they were afterwards charged. In the eighth century the monastic discipline was extremely relaxed both in the eastern and western provinces, and all efforts to restore it were ineffectual. Nevertheless, this kind of institution was in the highest esteem, and nothing could equal the veneration which was paid about the close of the ninth century to such as devoted themselves to the monastic or conventual life. This veneration induced several kings and emperors to call them to their courts, and to employ them in civil affairs of the greatest moment. Their reformation was attempted by Louis the Meek, but the effect was of short duration. In the eleventh century they were exempted by the popes from the authority of their sovereigns, and new orders of monks were continually established; insomuch that in the Council of Lateran which was held in the year 1215, a decree was passed, by the advice of Innocent III. to prevent the establishment of any new monastic institutions; and several were entirely suppressed. In the fifteenth and sixteenth centuries, it appears, from the testimonies of Protestant writers, that the monks were generally indolent, illiterate, profligate, and licentious epicures, whose views in life were confined to opulence, idleness, and pleasure. However, the Reformation had a manifest influence in restraining their excesses, and rendering them more circumspect and cautious in their external conduct.

Monks are distinguished by the colour of their habits, into black, white, gray, &c. Amongst the monks, some are called *monks of the choir*, others *professed monks*, and others *lay monks*, the last being destined for the service of the convent, and having neither clericate nor literature.

Cloistered MONKS are those who actually reside in the house, in opposition to extra-monks, who possess benefices depending on the monastery.

Monks are also distinguished into *reformed*, whom the civil and ecclesiastical authority have made masters of ancient convents, and put it in their power to retrieve the ancient discipline, which had been relaxed; and *ancient*, who remain in the convent, to live in it according to its establishment at the time when they made their vows, without obliging themselves to submit to any new reform.

Monk, George || Monkwearmouth.

Anciently the monks were all laymen, and were only distinguished from the rest of the people by a particular habit and an extraordinary devotion. Not only were the monks excluded from the priesthood, but even priests were expressly prohibited from becoming monks, as appears from the letters of St Gregory. Pope Syricius was the first who called them to the clericate, on occasion of the great scarcity of priests under which the church was then supposed to labour; and since that time the priesthood has been usually united to the monastical profession.

MONK, *George*, Duke of Albemarle, a personage memorable for having been the principal agent in restoring Charles II. to his crown, was descended from an ancient family, and born in Devonshire in 1608. Being an unprovided younger son, he dedicated himself to arms from his youth, and obtained a pair of colours in the expedition to the Isle of Rhé; he afterwards served with reputation in the Low Countries, as well as in both King Charles's northern expeditions, and did such service in quelling the Irish rebellion, that he was appointed governor of Dublin, but was superseded by parliamentary authority. Being appointed major-general of the Irish brigade employed in the siege of Nantwich in Cheshire, he was taken prisoner by Sir Thomas Fairfax, and remained confined in the Tower of London until the year 1646, when, as the means of obtaining liberty, he took the covenant, and accepted a command in the Irish service under the parliament. He obtained the chief command of all the parliamentary forces in the north of Ireland, where he did signal services, until he was called to account for a treaty made with the Irish rebels; a circumstance which was only obliterated by his future good fortune. He served in Scotland under Oliver Cromwell, with such success, that he was left there as commander-in-chief; and he was one of the commissioners for uniting that kingdom with the newly-erected commonwealth. He also served at sea against the Dutch, and was treated so kindly on his return that Oliver is said to have grown jealous of him. He was, however, again sent to Scotland as commander-in-chief, and continued there five years; when he dissembled so well, and improved circumstances so dexterously, that he restored the king without any disturbance. For this service he was immediately rewarded with both honours and profit. He was created Duke of Albemarle, with an estate worth L.7000 a year, besides other emoluments; and he enjoyed the confidence of his master as a compensation for having forfeited that of the people. After his death in 1670, there was published a treatise composed by him whilst he remained prisoner in the Tower, entitled Observations on Military and Political Affairs, in small folio.

MONKWEARMOUTH, a town of the county of Durham, in the ward of Chester, 275 miles from London. It is divided from Bishopswearmouth by the river Wear, over which there is a bridge made wholly of cast iron, except the pins binding the parts together, which are of wrought iron. It is sufficiently high to admit of ships passing under it without lowering their topmasts. An ancient monastery stood here, from which its name is in part derived. The population amounted in 1801 to 1103, in 1811 to 1091, in 1821 to 1278, and in 1831 to 1498. Adjoining to it is the populous district or suburb, but comprised in the same parish, Monkwearmouth Stone. It is chiefly inhabited by sailors, and by a numerous class called keelmen, who are employed in conveying coals in barges, provincially called keels, from the interior of the country to the larger vessels.

Mon-mouth || Mon-mouth-shire.

The population of this district amounted in 1801 to 4239, in 1811 to 4264, in 1821 to 4924, and in 1831 to 6051.

MONMOUTH, James Duke of, son of Charles II. by Mrs Lucy Walters, was born at Rotterdam in 1649. Upon the Restoration, he was called over to England, where the king received him with all imaginable joy, and created him Earl of Orkney, which was changed into that of Monmouth; and he took his seat in the House of Peers in the ensuing session of parliament. He married Anne, the heiress of Francis earl of Buccleuch; and hence it came to pass that he had also the title of *Buccleuch*, and took the surname of *Scott*, according to the custom of Scotland. In 1668 his father made him captain of his life-guard of horse; and in 1672 he attended the French king in the Netherlands, and gave proofs of bravery and conduct. In 1673 the king of France appointed him lieutenant-general of the army with which he appeared before Maestricht; and he behaved with great gallantry in the attack of that place, being the first who entered it in the assault. He returned to England, and having been received with all possible respect, was appointed chancellor of the university of Cambridge. After this he went to assist the Prince of Orange to raise the siege of Mons, and contributed not a little towards the success of the enterprise. He again returned to England, and was sent, in quality of general, to quell an insurrection in Scotland, which he effected; but soon afterwards he fell into disgrace; for, being a Protestant, he was deluded into ambitious schemes, upon the hopes of the exclusion of the Duke of York. He conspired against his father and the duke; and when the latter came to the throne by the title of James II. he openly appeared in arms, encouraged by the discontent that prevailed; but coming to a decisive battle before he had sufficient force to oppose the royal army, he was defeated, made prisoner, tried for high treason, condemned, and beheaded, in 1685, at the age of thirty-six.

Monmouth, the capital of the county of the same name, 132 miles from London. It is situated at the junction of the river Munnow with the Wye, and there are bridges over both streams. It is indifferently well built, has a town-hall in the market-place, built on pillars, which form a handsome colonnade, ornamented with a statue of King Henry V., who was born in this town. At the extremity of the town is the county gaol and court-house, commodiously arranged, and the former well regulated. It is incorporated, and is divided into four wards, which elect a mayor, four aldermen, and eleven councillors. It has long returned one member to the House of Commons, and continues to do so under the reform act. As the river Wye is navigable from Chepstow, some trade arises from that communication. The country around, but especially on the banks of the Wye, is highly picturesque and beautiful. Near it are several objects of antiquity, which are much visited. The population amounted in 1801 to 3345, in 1811 to 3503, in 1821 to 4164, and in 1831 to 4916.

MONMOUTHSHIRE. This county was, before 1585, a part of Wales, but has since been a part of England, although the greater part of the inhabitants still speak one of the three dialects of the Welsh language; so that in some of the churches divine service is conducted in that tongue, and in others alternately in that and in English.

Monmouthshire is bounded on the north by Herefordshire, on the east by Gloucestershire, on the south by the river Severn, and on the west by the Welsh counties of Brecon and Glamorgan. Its greatest length is thirty-three miles, its greatest breadth twenty-six, and its circumference 110 miles. The square extent is 516 miles, or 330,240 acres.

The face of the country is highly diversified, exhibiting every gradation from lofty and bleak mountains to highly verdant and beautiful sequestered valleys. Some of the mountains, as the Sugar-loaf, of 1850 feet, the Blorenge, of 1720, and the Skyridvawr of 1498 feet, with several others, display their summits for many months covered with snow, whilst their sides, near the bottom, are cultivated with the different species of grain, and terminate in meadows of the most luxuriant fertility. Mr Fox, in his Agricultural Survey of this county, divides it into three districts. The first, comprising the southern division, consists in part of large tracts of moor or marsh land, exhibiting in some parts of it a great depth of unctuous loamy soil, and in others a vast body of black peaty earth. In certain parts of this district the soil is of a light loamy consistence, highly favourable to the growth of various trees. Another portion is a mixture of clay and loam, forming fertile meadows; and above them is an excellent red soil, in which turnips, potatoes, and grain, liberally repay the cultivator. The second division comprehends the eastern part of the county, extending to a considerable but varying distance on both sides of the river Usk. The soil is of a faint red colour, highly grateful; and being carefully cultivated, the whole displays the appearance of great fertility. The third division comprises the western and most mountainous parts of the county. The soil on the hills is generally of a thin peaty nature, covering strata of stone, underneath which are mines of coal and iron ore, of almost unbounded productiveness. The low lands in this division are chiefly in the state of meadow and pasture, whilst the middle lands are occupied partly by pasture and partly by arable husbandry.

Mon-mouth-shire.

The rivers of this county have been generally celebrated for the picturesque scenery which their banks display, and which, added to the many remains of antiquity that are to be seen near them, invite the visits of numerous parties in the summer months, and afford the highest gratification to travellers of taste. The most eminent of these rivers, in beauty as well as utility, is the Wye. It rises on the southern side of Plinlimmon, in Montgomeryshire, and, forming the line of division between the counties of Brecon and Radnor, passes through a part of Herefordshire, and, entering this county at Dizon, becomes navigable for boats at Monmouth, and empties itself into the Severn at Chepstow. The beauties of this stream are derived from the sinuosities of its course, the uniformity of its breadth, the picturesque country through which it flows, and, amongst many other striking objects on its banks, from the Abbey of Tintern, and the mansion and grounds of Piercefield. The tide in this river rises at Chepstow to a greater height than in any other English river; at the bridge of that town the elevation varies, on some occasions, from fifty to sixty feet, and it takes place with most unusual celerity. The Usk rises in the black mountains of Brecknockshire, and, when it enters this county, passes between lofty hills, which gives its borders every variety of beauty that landscape can display. It is navigable for a short distance, but only for barges. It abounds with salmon, some of which are frequently caught in it of a most unusual size. The other rivers are the Rumney, the Munnow, and the Ebwy, each of which has peculiar and characteristic beauties.

The heavy productions of this county, iron, coal, and limestone, have given rise to the establishment of various canals for their conveyance. The Monmouthshire Canal begins at Newport, and, dividing into two branches, connects that town, by the one with Pontypool and Pontnewyd, and by the other with Crumlin Bridge. The Brecknockshire Canal unites with this, and passes, in its course, under a hill, by means of a tunnel 360 feet in length. The county is most abundantly supplied with railroads leading from the principal mining districts to the canals; and many private mines have small railways, provincially called tramroads, leading to the principal iron railroads, by which a facility is afforded for the conveyance of productions through a country the roads of which are eminently bad.

Monmouthshire.

The agricultural productions are wheat, barley, and oats, with a few pease and beans. They are sufficient for the supply of the inhabitants, and the small surplus, as well as much fruit, is sent to the markets of Bristol. On the arable lands the system of summer fallowing is pretty generally pursued. The principal manure is lime, the stone from which it is burned being most abundant. The oxen of this county are highly esteemed, both for draught and for fattening. They are usually of a deep-red colour, short in the legs, and compact in the carcass, being a cross between the breeds of Hereford and Glamorgan. They are very docile in harness, and will fatten so as to weigh from seven to nine hundredweight. They are much sought after by the English graziers, who purchase them when young, and, after employing them in labour, fatten them for the butcher. The sheep are remarkably small, and the wool is short and coarse; but the flesh is fine in the grain, and of a most delicate flavour. Of late years much improvement has been made in the flocks by judicious crosses with the Cotswold, Southdown, and Dorset sheep. The horses of the county are generally of a very meagre, light, and uncompact breed. In this county and Brecknockshire the breeding and rearing of mules is carried to a greater extent than in any other part of the island. They are found very beneficial in the hilly districts, where the mines are worked. Male asses are imported from Spain and the south of France, to propagate, and the mules are frequently of a size and strength equal to the natives of those countries.

The landed property of this county is in few hands, but divided generally into small farms, varying in rent from L.70 to L.200. The leases are generally for twenty-one years, and the conduct of the landlords to their tenants is liberal, and somewhat parental. Many farms are held by copy of the court-roll.

The greatest riches of Monmouthshire are derived from its mines. Coal and iron ore abound in all the hills. The facilities for interior conveyance have already been noticed. The coals of this county have, under the act of parliament for constructing the canal, the peculiar privilege of being carried to the opposite shore, including the city of Bristol and the towns on that coast, as far as Bridgewater, without paying the water-borne duty. This gives to them a monopoly of those large markets, to the exclusion of the collieries in the Forest of Dean, and of Glamorgan and Carmarthenshire. The proprietors of these last-mentioned mines have petitioned parliament to be placed on a similar footing; but, after a most patient investigation of all the circumstances in a committee, the peculiar rights of the coals brought by the Monmouthshire Canal were confirmed. The iron mines were worked as early as the reign of Queen Elizabeth, and made a rapid progress; but, owing to the great consumption of wood, which soon caused a scarcity of fuel, they had sunk very low, till about fifty years ago, when the mode of making iron from coke was introduced. This discovery, with the improvements in machinery, has given a vast impulse to the working of the iron mines. Fifteen or sixteen works, on the largest scale, and many smaller ones, have been established. At one period the weekly delivery of pig iron and bar iron from these different works is stated to have amounted to one thousand tons.

The abundance of iron, and the facility of intercourse with Cornwall, have led to the establishment of some very extensive manufactories of tin plates. The manufactory of a kind of Japan ware was first practised in England by Thomas Allgood of Pontypool, in the reign of Charles II.; and though the skill of Birmingham has been successfully exerted to rival the town whence that ware derived its name, the business is still continued there, but upon a limited scale. The manufactory of caps, for which Monmouth was celebrated at the period when Shakspeare wrote, has long been abandoned. At Newport and Chepstow there are some considerable establishments for building ships.

Monmouthshire.

Few parts of the island contain more numerous or better preserved remains of Roman and Saxon antiquity than this county. Caerleon was long the metropolis of the British dominions, and the residence of King Arthur. The ruins of the wall, about 530 yards by 480, may still be traced; and the vast masses of stones, which now appear in a confused state, show that it was formerly a place of great importance. There are many Roman encampments still visible. The remains of the abbeys of Gracedieu, Llantarnam, Llanthony, and Tintern, and of the priories of Goldcliff, Thynemark, Monmouth, and Usk, invite the close examination of antiquaries. The castles of Abergavenny, Caerleon, Caldecot, Castell-Glas, Chepstow, Dinham, Grossmont, Llanfair, Scenfrith, Striguil, Usk, and Llandeilo, are the most remarkable amongst numerous other similar buildings. The character of the architecture of the churches of Abergavenny, Caerleon, Caldecot, Chepstow, Newport, and others, discovers a very ancient origin. The antiquities of Monmouthshire would, indeed, require a volume for their delineation.

The county gives the title of Earl of Abergavenny to the family of Neville, not by creation or writ, but as possessors of the castle of that town. The Irish Marquis of Ormond derives from it the title of Baron Butler; and the Duke of Beaufort is Baron Herbert of Chepstow and Rogland, and Baron Beaufort of Caldecot Castle. The members returned to the House of Commons are two for the county, and one for the united boroughs of Monmouth, Newport, and Usk. The whole county is within the diocese of Llandaff, except three parishes, which are in St David's, and three others in that of Hereford.

The population of this county at the periods of the four decennial enumerations has been as follows: In 1801 it amounted to 45,582, in 1811 to 62,127, in 1821 to 71,833, and in 1831 to 98,200, thus having more than doubled itself in thirty years. The number of baptisms in the year 1830 was 840 males and 796 females; the burials were 617 males and 577 females; the marriages were 677; and the illegitimate children 71 males and 71 females. The number of families in the same year was 19,911, of whom 5614 were chiefly employed in agriculture, 8626 were chiefly employed in trade, manufactures, and handicraft, and the remainder, 5671, were not comprised in either of the preceding classes. The males under twenty years of age were 26,910. The occupiers of land employing labourers were 1648, those not employing labourers were 1143, and the number of labourers in agriculture was 4845. The persons employed in manufacture or making manufacturing machinery was 3203; those employed in retail trade or handicraft, as masters or as workmen, were 6640; the capitalists, bankers, professional and other educated men, amounted to 805; the labourers employed in labour not agricultural were 7173; other males twenty years of age, excepting servants, 1011; male servants under twenty years of age 122, and above twenty years 343. The female servants of all ages were 3741. The annual value of the whole real property of the county, as assessed for the income tax in 1815, was L.295,097.

There are but seven towns having markets, but some others are more populous than these. Those of more than 1000 inhabitants are as follows:

Trevethin with Pontypool	10,280	Penmaen	2,175
Newport	7,064	Llanover	2,124
Aberystwyth	5,992	Llanwenarth	1,956
Ushkawreod	5,359	Mynydd-maen.	1,918
Monmouth	4,916	Panteague	1,584
Abergavenny	4,230	Machen	1,173
Chepstow	3,524	Usk	1,160
Mamhole	3,208	Caerleon	1,070

Monoceros || Monophysites.

The seats of noblemen and gentlemen within the county are very numerous. The most remarkable are, Troyhouse, Duke of Beaufort; Bix Weir, General Rooke; Courtfield, William Vaughan, Esq.; Coldbrook, J. H. Williams, Esq.; Dynastow Court, Samuel Bosanquet, Esq.; Kesneyshouse, L. Lord, Esq.; Llanarth Court, John Jones, Esq.; Llanofer, Benjamin Waddington, Esq.; Llanvitsangle, Earl of Oxford; Mamheled, W. Morgan, Esq.; Mayndec, Sir Robert Kemeys; Pen Park, — Williams, Esq.; Piercefield, late Nathaniel Wells, Esq.; Pontypool, C. H. Leigh, Esq.; Tredgar, Sir Charles Morgan, Bart.; Trewyn, J. Rosier, Esq.; Wynastow Court, Thomas Swinnerton, Esq.

MONOCEROS, UNICORN, in *Astronomy*, a southern constellation, formed by Hevelius, and consisting, in his catalogue of nineteen stars, but in the Britannic catalogue, of thirty-one stars.

MONOCHORD, an instrument by which the several proportions of musical sounds and intervals, as well in the natural as in the tempered scales, are tried. Originally it had, as its name implies, only one string; but it is better constructed with two; for, by means of the additional string, an opportunity is afforded of judging of the harmony of two tempered notes in every possible variety of temperament.

MONODY, in ancient poetry, a mournful kind of song, sung by a person all alone, to give vent to his grief. The word is derived from μονος, *alone*, and ἀδω, *I sing*.

MONOGAMY, compounded of μονος, *alone*, and γαμος, *marriage*, the state or condition of those who have only married once, or who are restrained to a single wife. See POLYGAMY.

MONOGRAM, a character or cipher, composed of one, two, or more letters interwoven, being a kind of abbreviation of a name, anciently used as a seal, badge, arms, &c.

MONOMOTAPA. See MOTAPA.

MONOPHYSITES (from μονος, *solus*, and φυσις, *natura*), a general name given to all those sectaries in the Levant who only own one nature in Jesus Christ, and who maintain that the divine and human natures of Christ were so united as to form only one nature, yet without any change, confusion, or mixture of the two natures.

The *Monophysites*, however, properly so called, are the followers of Severus, a learned monk of Palestine (who was created patriarch of Antioch in 513), and of Petrus Fullensis. The Monophysites were encouraged by the Emperor Anastasius, but depressed by Justin and succeeding emperors. However, this sect was restored by Jacob Baradeus, an obsure monk, insomuch that when he died bishop of Edessa, in the year 588, he left it in a most flourishing state in Syria, Mesopotamia, Armenia, Egypt, Nubia, Abyssinia, and other countries. The laborious efforts of Jacob were seconded in Egypt and the adjacent countries by Theodosius bishop of Alexandria, and he became so famous that all the Monophysites of the East considered him as their second parent and founder, and were called *Jacobites*, in honour of their new chief. The Monophysites are divided into two sects or parties; the one African, the other Asiatic. At the head of the latter is the patriarch of Antioch, who resides for the most part in the monastery of St Ananias, near the city of Merdin; the former are under the jurisdiction of the patriarch of Alexandria, who generally resides at Grand Cairo, and are subdivided into Copts and Abyssinians. From the fifteenth century downwards, all the patriarchs of the Monophysites have taken the name of *Ignatius*, in order to show that they are the lineal successors of Ignatius, who was bishop of Antioch in the first century, and consequently the lawful patriarchs of Antioch. In the seventeenth century a small body of the Monophysites in Asia abandoned for some time the doctrine and institution of their ancestors, and embraced the communion of Rome. But the African Monophysites, notwithstanding that poverty and ignorance which exposed them to the seductions of sophistry and gain, remained firm in their principles, and made an obstinate resistance to the promises, presents, and attempts employed by the papal missionaries to bring them under the Roman yoke; and in the eighteenth century, those of Asia and Africa have persisted in their refusal to enter into the communion of the Catholic church, notwithstanding the earnest entreaties and alluring offers which have from time to time been made by the pope's legates to conquer their inflexible constancy. The Monophysites propagate their doctrine in Asia with zeal and assiduity, and have at length gained over to their communion a part of the Nestorians, who inhabit the maritime coast of India.

Monopli || Monro.

MONOPOLI, a city of the province of Bari, in the kingdom of Naples, on the spot where formerly stood the Roman city of Egnatia. It is situated on the sea-shore, between three hills, and has a small harbour, whence extensive fisheries are carried on. It suffers much at times from a scarcity of water, as there are neither brooks nor springs, the only supply being from rain. It is the seat of a bishop, and, besides the cathedral, contains fourteen churches, nine of which appertain to as many convents and monasteries. It contains 15,500 inhabitants.

MONOPOLY. See on this head COMMERCE and POLITICAL ECONOMY.

MONOSYLLABLE, in *Grammar*, a word which consists only of one syllable, and is composed either of one or more letters pronounced at the same time.

MONOTHELITES (compounded of μονος, *single*, and θελημα, *will*, from θελω, *volo*, I will), an ancient sect, which sprung out of the Eutychians, and were so called from allowing only one will in Jesus Christ. The opinion of the Monothelites took its rise in 630, and had the Emperor Heraclius for an adherent; it was the same with that of the Acephalous Severians. They allowed of two wills in Christ, considered with regard to the two natures, but reduced them to one, by reason of the union of these natures, thinking it absurd that there should be two free wills in one and the same person. They were condemned by the sixth general council in 680, as being supposed to destroy the perfection of the humanity of Jesus Christ, by depriving it of will and operation. Their sentiments were afterwards embraced by the Maronites.

MONOTONY, an uniformity of sound, or a fault in pronunciation, when a long series of words is delivered in one unvaried tone.

MONREALE, a parliamentary city of the kingdom of Naples, in the island of Sicily and province of Mazzara, situated on the side of a hill, at the foot of which the river Ammiraglo flows, four post miles from Palermo. It is the seat of an archbishop, is both healthy and fertile, and has a cathedral, a palace, several monasteries, with 12,770 inhabitants, who depend chiefly on agriculture, and whose most valuable product is abundance of almonds.

MONRO, DR ALEXANDER, senior, a celebrated physician and anatomist, was the son of Mr John Monro, who was for some years a surgeon in the army under King William in Flanders, and who afterwards settled in that capacity in Edinburgh. The subject of this biographical sketch was born in London in 1697. He showed an early inclination to the study of physic; and his father, after giving him the best education which Edinburgh then afforded, sent him successively to London, Paris, and Leyden, to improve himself further in his profession. At London he attended the lectures of Hawksbee and Whiston on experimental philosophy, and the anatomical demonstrations of Mr Cheselden. At Paris he frequented the hospitals, and the lectures on the different branches of physic and surgery; and, towards the end of autumn 1718, he went to Leyden, and studied under the celebrated Boerhaave. On

Monro. his return to Edinburgh in the autumn of 1719, Drummond and Macgill, who were then conjunct nominal professors and demonstrators of anatomy to the Company of Surgeons, having resigned in his favour, his father prevailed on him to read some public lectures on anatomy, and to illustrate them by showing the curious anatomical preparations which he had made and sent home when abroad. He at the same time persuaded Dr Alston, then a young man, to give some public lectures on botany. Accordingly, in the beginning of the winter 1720, these two young professors began to give regular courses of lectures, the one on the materia medica and botany, the other on anatomy and surgery; and these were the first regular courses of lectures on any of the branches of medicine which had ever been read at Edinburgh, and may be looked upon as the opening of that medical school which has since acquired so great reputation all over Europe.

In the summers of 1721 and 1722, Dr Monro, by the persuasion of his father, read some lectures on chirurgical subjects, particularly on wounds and tumours, which he never would publish, having written them in a hurry, and before he had much experience; but he inserted from time to time the improvements which he thought might be made in surgery, in the volumes of Medical Essays and Observations, to be hereafter mentioned.

About the year 1720, his father communicated to the physicians and surgeons at Edinburgh a plan which he had long formed in his own mind, of having the different branches of physic and surgery regularly taught at Edinburgh. This was highly approved of by them; and through their interest regular professorships of anatomy and medicine were instituted in the university. Such was the foundation of the Medical Faculty of Edinburgh. His son, Dr Monro, was first made university professor of anatomy; and, two or three years afterwards, Drs Sinclair, Rutherford, Innes, and Plummer, were made professors of medicine; the professorship of materia medica and botany, which Dr Alston then held, having been added to the university many years before. Immediately after these gentlemen were elected professors, they began to deliver regular courses of lectures on the different branches of medicine; and they and their successors have uniformly continued to do so every winter since that time.

But the plan for a medical education at Edinburgh was still incomplete without an hospital, where students could see the practice of physic and surgery, as well as hear the lectures of the professors. A scheme was therefore proposed by Dr Monro's father, and others, particularly the members of the Royal College of Physicians and Board of Surgeons, for raising by subscription a fund for building and supporting an hospital for the reception of diseased poor; and Dr Monro published a pamphlet setting forth the advantages which would attend such an institution. In a short time a very considerable sum of money was raised; a small house was fitted up; and patients were admitted into it, and regularly attended by many of the physicians and surgeons in town. As the fund for this charity had considerably increased, owing in a great measure to the activity and influence of Mr George Drummond, the foundation was laid of the present large, commodious, and useful hospital, the Royal Infirmary, in the planning of which Dr Monro suggested many useful hints; and, in particular, the elegant room for chirurgical operations was designed and executed under his direction. Provost Drummond and he were nominated the building committee, and the fabric was completed in a short space of time. It has since been so largely endowed, as to be capable of receiving a great number of diseased poor, whose various cases the students of physic and surgery have an opportunity of seeing daily treated with the greatest attention and care by physicians and surgeons eminent in their profession; and a register of the particulars of all the cases which have been received into the house since it was first opened has been kept, in books appropriated to that purpose, for the use of the students. Monro.

In order to render the hospital of still further use to the students, Dr Monro frequently, whilst he continued professor of anatomy, gave lectures on the chirurgical cases; and Dr Rutherford, then professor of the practice of physic, began, in the year 1748, to deliver clinical lectures, to be continued every winter, on the most remarkable cases which occurred in the hospital.

Dr Monro, though he was elected professor of anatomy in the year 1721, was not received into the university till the year 1725, when he was inducted along with Mr Colin Maclaurin, the celebrated mathematician, with whom he ever lived in the strictest friendship. From this time he regularly every winter gave a course of lectures on anatomy and surgery, from October to May, upon a most judicious and comprehensive plan; a task in which he persevered with the greatest assiduity, and without the least interruption, for nearly forty years; and so great was the reputation he had acquired, that students flocked to him from the most distant corners of his majesty's dominions.

In 1759 the professor entirely relinquished the business of the anatomical theatre to his son Dr Alexander Monro, who had returned from abroad, and had assisted him in the course of lectures the preceding year. But after this resignation, he still endeavoured to render his labours useful to mankind, by reading clinical lectures at the hospital for the improvement of the students. Of these, Dr Duncan, who was one of his pupils, has given an interesting account. "There I had myself the happiness of being a pupil, who profited by the judicious conduct of his practice, and was improved by the wisdom and acuteness of his remarks. I have indeed to regret that I attended only the last course of lectures in which he had ever a share, and at a time when he was subjected to a disease which proved at length fatal. Still, however, from what I saw and from what I heard, I can venture to assert, that it is hardly possible to conceive a physician more attentive to practice, or a preceptor more anxious to communicate instructions. His humanity in the former of these characters led him to bestow the most anxious care on his patients while they were alive; and his zeal in the latter induced him to make them the subject of useful lessons when they happened to die. In the different stations of physician, of lecturer, and of manager in the hospital, he took every measure for inquiring into the causes of diseases, by dissection. He personally attended the opening of every body; and he not only dictated to the students an accurate report of the dissection, but with nice discrimination contrasted the diseased and sound state of every organ. Thus, in his own person he afforded to the students a conspicuous example of the advantages of early anatomical pursuits, as the happiest foundation for a medical superstructure. His being at once engaged in two departments, the anatomical theatre and clinical chair, furnished him with opportunities both on the dead and living body, and placed him in the most favourable situation for the improvement of medicine; and from these opportunities he derived every possible advantage which they could afford."

His father, Mr Monro, lived to an advanced age, and enjoyed the unspeakable pleasure of beholding a son, esteemed and regarded by mankind, the principal actor in the execution of his favourite plan, which formed the great object of his life, that of founding a seminary of medical education in his native country. The son, who survived him nearly thirty years, had the satisfaction to behold this seminary of medical education frequented yearly by three or four hundred students, many of whom came from the most distant corners of his majesty's dominions, and to see it

Mons
Monsieur.

arrive at a degree of reputation far beyond his most sanguine hopes. Dr Monro died on the 10th of July 1767, in the 70th year of his age.

Of his works, the first in order is his Osteology, which was written for the use of students, but is capable also of affording instruction to the oldest and most experienced practitioner; as, besides a minute description of the parts copied from nature, it everywhere abounds with new and important observations immediately applicable to practice. It has been translated into many different languages; has passed through numerous editions; and has been reprinted in foreign countries in the most superb manner, accompanied with elegant and masterly engravings. His description of the Lacteal Sac and Thoracic Duct contains the most accurate account of that important part of the body which has yet been published; and his Anatomy of the Nerves will transmit to posterity an excellent example of accurate dissection, faithful description, and ingenious reasoning. The six volumes of Medical Essays and Observations, published by a society in Edinburgh, are universally known and esteemed. To that society he was appointed secretary; but, after the publication of the first volume, to which he had largely contributed, the members growing remiss in their attendance, he became the sole collector and publisher of the work. To him we are therefore in a great measure indebted for those numerous and important discoveries with which this publication has enriched every department of medical knowledge. In the two first volumes of the Physical and Literary Essays, published by the Physical Society of Edinburgh, in which he had the rank of one of the presidents, we find several papers written by him, which are not the least ornaments of that collection. His account of the Success of Inoculation in Scotland may be considered as his last publication. It demonstrates his extensive correspondence and indefatigable industry, and has had great influence in promoting that salutary practice. Besides these, he was also the author of several other elegant and masterly productions, which were either never published, or were published without his knowledge and from incorrect copies. A collection of his works, properly arranged, corrected, and illustrated with copperplates, was published by Dr Alexander Monro, his son and successor in the anatomical chair, in a splendid quarto volume, printed at Edinburgh in 1781; and to this was prefixed a life of the author, by another of his sons, Dr Donald, physician in London.

MONS, an arrondissement in the province of Hennegau, in the Netherlands, comprehending nine cantons, divided into 141 communes, with 151,500 inhabitants. The city of the same name is the capital both of the province and the arrondissement. It is situated on the river Trouille, and is strongly fortified; it is well built, and its environs are adorned with tasteful walks. It contains 4600 houses, and about 20,000 inhabitants. Near to it are found millstones, and abundance of coal. The trade is considerable, consisting of cotton and woollen goods, ironmongery, soap, china, and refined sugar. Long. 3. 52. E. Lat. 50. 27. N.

MONSEIGNEUR, in the plural *Messeigneurs*, a title of honour and respect used by the French in writing to persons of superior rank or quality.

Dukes, peers, archbishops, bishops, and presidents *à mortier*, were complimented with the title of *Monseigneur*. In the petitions presented to the sovereign courts, they used the term *Messeigneurs*.

MONSEIGNEUR, absolutely used, was a title applied to the dauphin of France. This custom was unknown till the time of Louis XIV. before which the dauphin was styled *Monsieur le Dauphin*.

MONSIEUR, in the plural *Messieurs*, a term or title of civility, used by the French in speaking to their equals, or those a little below them.

MONSIEUR, absolutely used, was a title appropriated to the second son of France, or the king's brother. The king was also called *Monsieur*, but that only by the children of France.

Monsieur
‖
Monster.

MONSOON, a regular or periodical wind, in the East Indies, blowing constantly in the same direction during six months of the year, and contrariwise during the remaining six.

In the Indian Ocean, the winds are partly general, blowing all the year round the same way, as in the Ethiopic Ocean; and partly periodical, that is, blowing half the year one way, and the other half year on the opposite points; and those points and times of shifting differ in different parts of this ocean. These latter are what have been called *monsoons*.

The shifting of these monsoons does not take place all at once. In some places the time of the change is attended with calms, but in others with variable winds; and those of China, when they cease to be westerly, are liable to become tempestuous; indeed such is their violence, that they seem to be of the nature of the West India hurricanes, and render the navigation of those seas very unsafe at the time of the year when they prevail. These tempests the seamen call the *breaking up of the monsoons*.

Monsoons, then, are a species of what we otherwise term *trade winds*. They take the denomination of *monsoon* from an ancient pilot, who first crossed the Indian Sea by means of them; though others derive the name from a Portuguese word signifying motion or change of wind and sea.

MONSTER, a birth or production of a living being, degenerating from the proper and usual disposition of parts in the species to which it belongs; as, when there are too many members, or too few, or some of them are extravagantly out of proportion, either on the side of excess or defect. The word comes from the Latin *monstrum*, a derivative of *monstrando*, showing; and hence also the box in which relics were anciently kept to be shown was called *monstrum*. Dugdale mentions an inventory of the church of York with this article, *Item unum monstrum cum ossibus sancti Petri in beryl, et crucifixo in summitate*. Aristotle defines a monster to be a defect of nature, when, acting towards an end, she cannot attain to it, from some of the principles being corrupted.

Monsters do not propagate their kind, for which reason some rank *mules* amongst the number of monsters, as also *hermaphrodites*. Females which bring forth twins are found most liable to produce monsters. The reason probably is, that although the twins are covered with one common chorion, yet they have each their separate amnios, which by their contiguity may chance to grow together, and so occasion a confusion or blending of the parts.

Various theories have been proposed by philosophers and physiologists to account for the production of monsters. But after all, it must be confessed, that we are very little acquainted with those deviations from the ordinary course of nature.

With respect to structure, monsters are of various kinds. Some have an excess or defect in certain parts, such as those which are called *acephalous*, or want the head; those which have two heads, two arms, two legs, and one body, or which have two bodies and one head, or which have three legs; and those which want the arms or the legs. Others err through an extraordinary and deformed conformation, through an unnatural union of certain parts or viscera, through a great derangement in one or more of their members, and through the extraordinary place which these often occupy in consequence of this derangement or transposition. The monster described by Dr Eller of the Academy of Berlin was of this kind. It was a fœtus of nine months, twenty-eight inches long, with an enormous head and frightful countenance; and in the middle

Monster.

of a broad and vast forehead it had a reddish eye, without either eyebrows or eyelids, and sunk deep into a square hole. Immediately below this eye was an excrescence which strongly resembled a penis with a glans, a prepuce, and an urethra; the part covered with hair was likewise below the nape of the neck. In other monsters we meet with the unnatural union of some parts, which, from their destination and functions, ought always to be separate; and the separation of other parts, which, for the same reasons, ought constantly to be united. The reader may see the different ways in which the formation of monsters takes place, in four memoirs by M. Leméry, inserted in *L'Histoire de l'Académie des Sciences*, 1738 and 1739.

In the volume published by the Academy of Sciences in the year 1724, mention is made by M. Geoffroy of a monster born in Barrois, 1722. This monstrous production consisted of two children without the inferior extremities, and joined together by a common navel. Each of them had a nurse, sucked, and eat pap; and the one sucked whilst the other slept. The reader may likewise consult the second part of Winslow's Memoirs on Monsters, inserted in the volume published by the Academy of Sciences in 1734, where he will find the history of the two very extraordinary twin monsters, who exhibited during their lives a great difference in their moral and physical qualities. We are obliged to refer simply to these memoirs, as they are too long for abridgment.

It is observed by Haller, that in some monsters the natural structure has been changed by some shock or passion, whilst in others the structure, independently of any accident, appears to have been originally monstrous; such as when all the members are reversed from left to right, when the person has six fingers, and in many other instances. M. de Maupertuis mentions that there was at Berlin a family who for several generations had six fingers on each hand. M. de Riville saw an instance of this at Malta, of which he has given a description. M. Renou, surgeon at Pommeraye, in Anjou, published an account of some families with six fingers, who were to be found in several parishes of the Lower Anjou, and which had existed there from time immemorial. This deformity was perpetuated in these families even when they intermarried with persons who were free from it. Whether the propagation of these supernumerary organs, which are not only useless, but inconvenient and even disagreeable, be owing to the father or mother, the children of both sexes are subject to it indiscriminately. A father and mother with six fingers frequently have a part, and sometimes the whole of their children, free from this deformity; but it again makes its appearance, and in a very great degree, in the third generation. From this it appears that such a fault in the conformation is hereditary. M. Reaumur likewise published the history of a family in the island of Malta, the children of which were born with six fingers and six toes. But it deserves to be inquired, whether these supernumerary fingers were real fingers. (The reader may here consult the *Journal de Physique* for November 1774, p. 372.) This variety of *sexdigitary* hands and feet is not comprehended in the *Recherches sur quelques Conformations Monstrueuses des Doigts dans l'Homme*, which is inserted in the Memoirs of the Academy of Sciences for 1771. In the *Journal de Physique* for August 1776, we find a description of a double uterus and vagina observed in a woman who died in childbed, by Dr Purcell of Dublin; and in that for June 1788, we have an account, by Baron Dietrich, of a man with seven fingers on each hand.

Monsters are more common and more extraordinary in the vegetable than in the animal kingdom, because the different juices are more easily deranged and confounded together. Leaves are often seen, from the internal parts of which other leaves spring forth; and it is not uncommon to see flowers of the ranunculus from the middle of which issues a stalk bearing another flower. Bonnet informs us, that in certain warm and rainy years he has frequently met with monsters of this kind in rose-trees. This observer saw a rose, from the centre of which issued a square stalk of a whitish colour, tender and without prickles, which at its top bore two flower-buds opposite to each other, and totally destitute of a calyx; and a little above the buds issued a petal of a very irregular shape. Upon the prickly staff which supported the rose, a leaf was observed which had the shape of a trefoil, together with a broad flat pedicle. In the Memoirs of the Academy of Sciences for 1707, mention is made of a rose, from the centre of the leaves of which issued a rose branch two or three inches long, and furnished with leaves. In the Memoirs for 1775, a singular instance is mentioned of a monstrosity observed by Duhamel, in an apple-tree ingrafted with clay. At the place of the insertion there appeared a bud which produced a stalk and some leaves; the stalk and the pedicle of the leaves were of a pulpy substance, and had the most perfect resemblance both in taste and smell to the pulp of a green apple. An extraordinary *chamæmelum* is mentioned in the *Acta Helvetica*. Bonnet, in his *Recherches sur l'Usage des Feuilles*, mentions likewise some monstrous productions which have been found in fruits with kernels, analogous in their nature to those which occur in the flowers of the ranunculus and of the rose-tree. He observed a pear, from the eye of which issued a tuft of thirteen or fourteen leaves, very well shaped, and many of them of the natural size. He noticed a second pear which gave rise to a ligneous and knotty stalk, on which grew another pear somewhat larger than the first. The stalk had probably flourished, and the fruit had formed. Reynier has mentioned some individuals monstrous with respect to the flower, in the *Journal de Physique et d'Histoire Naturelle* for November 1785.

Montacute ‖ Montagnano.

These vegetable productions, which are so extraordinary, and so contrary to the common course of things, do nevertheless present deviations subject to particular laws, and reducible to certain principles, by distinguishing such as are perpetuated either by seed or by transplanting, from those which seem to be only accidental. Monstrosities which are perpetuated exist in the original organization of the seed of the plant, such as marked or curled leaves, &c. The word *monster* is more properly applied to those irregularities in plants which arise from frequent transplantation, and from a particular culture, such as double flowers; but those monstrosities which are not perpetuated, and which arise from accidental and transient causes deranging the primitive organization of the plant when it comes to be unfolded, being the effect of diseases, of heat or cold, of a superfluity or scarcity of juices, of a depravation of the vessels contributing to nutrition, of the sting of insects, and of contusions and natural grafts, retain also the name of *monsters*. Of this kind are knobs or swellings, stunting, gall-nuts, certain streaks, and other similar defects.

MONTACUTE, a small town of Somersetshire, in the hundred of Tintinhull, 123 miles from London. It has near it a singular mound or sharp hill, covering twenty acres at the base, on which a castle was built by Moreton, brother of William the Conqueror, who named it from his friend Drogo de Montacute. It was afterwards converted into a monastery and a borough. The inhabitants, who are chiefly occupied in making gloves and sail-cloth, amounted in 1801 to 827, in 1811 to 857, in 1821 to 973 and in 1831 to 1028.

MONTAGNANO, a city of Italy, in the Austrian delegation of Padua. It is situated on the Fiumecello, and is surrounded with walls. It contains a conventual and several other churches, with 8275 inhabitants, who are

Montagu. occupied in woollen manufactures, in tanneries, and in making hats. It is situated in longitude 11. 25. 30. E. and latitude 45. 13. 3. N.

MONTAGU, Lady Mary Wortley, an English lady of distinguished talents, but of eccentric character, was the eldest daughter of Evelyn Pierrepont duke of Kingston, and Lady Mary Fielding, daughter of William earl of Denbigh, and was born at Thoresby, Nottinghamshire, in the year 1690. Both on the father's and the mother's side Lady Mary came of a stirring race, the Pierreponts and Fieldings having taken active parts in the civil war, though under painful circumstances of family division. But there was genius as well as activity in her blood; for the mother of Beaumont the dramatist was a Pierrepont, and Lady Mary had a common ancestor with Villiers duke of Buckingham, who was her grand uncle. The Fieldings, however, were not thought very bright, until Henry, who was her second cousin, came to enhance their reputation; and Lady Mary says that they were all called "fair and foolish." At the age of four she lost her mother; but her grandmother, a sensible woman, appears to have done something towards supplying the place of her deceased parent. By Lady Mary's own account of her education, it was "one of the worst in the world;" but this is to be taken with very considerable qualification. She was indeed left to a superstitious nurse and a weak governess; but her understanding being naturally much superior to that of her instructress, she was induced to profit by her brother's advantages, and, under the tuition of his preceptors, acquired some knowledge of Latin, a smattering of Greek, and the rudiments of the French language. At the age of eight she had made considerable proficiency in her studies, and began to read all the books she could lay her hands on; poetry, philosophy, and romances, particularly those of the old French school, of which she became exceedingly enamoured. Her first known poetical effusion was an Epistle from Julia to Ovid, which she wrote at the age of twelve, and which, besides the complimentary cant of gallantry, exhibits a nice apprehension of the reigning melody in verse, being exactly in the style which Dryden would have employed in addressing Lady Castlemain, or Garth, in inscribing upon drinking glasses verses on the beauty of his mistress. At fifteen she formed a project of establishing an English nunnery; and had she then been mistress of an independent fortune, she would certainly (she says) have executed it, and elected herself lady-abbess. At twenty, she translated Epictetus, most probably from the Latin version, under the eye of her friend Bishop Burnet.

Amongst the early female friends of Lady Mary was Mrs Anne Wortley, sister of Mr Edward Wortley Montagu, whose father, Sidney, a son of the well-known Earl of Sandwich, had added the name of Wortley to that of Montagu, in consequence of his marriage with an heiress. Edward Wortley was not a man of gallantry, and had taken little pains to cultivate the acquaintance of his sister's friends; but happening one day to meet with Lady Mary Pierrepont in her apartments, he was so much struck with her wit and beauty, as well as charmed with the unusual accomplishment of a love for the classics, that, in a few days, he made her a present of Quintus Curtius, an author she had mentioned as never having read, accompanied with some verses, indifferent enough in themselves, but, from a person of his character, amounting to a declaration of love. His sister fanned the flame with all her might; and a correspondence ensued, which, after a good deal of hesitation, doubt, and indecision on the part of the lady, ended in the marriage of the parties. Mr Wortley has been represented as a dull phlegmatic country gentleman, of a tame genius and moderate capacity, or as a man of parts more solid than brilliant, which is only a civil way of saying the same thing; nor does there seem to be any good ground for questioning the accuracy of this description, although his attainments as a scholar, and his distinction as a politician, were both considerable. But however this may be, the marriage seems to have been ill assorted, and certainly proved unfortunate. There was probably no real affection upon either side; and if it be true that Lady Mary's temper was not good, Mr Wortley was scarcely the man to supply any defects on her part, or to bear long with such infirmities. That she possessed great good sense is evident; but her sarcasms and her self-will, united with a sense of superiority, and perhaps also some resentment of the coldness evinced towards her by her husband, sufficiently indicate the radical disparity, or rather incongruity, of character which existed between them. Montagu.

In 1714, Mr Wortley obtained a place in the treasury, and, in consequence, took his lady to court, where her wit, spirit, and beauty attracted general admiration, and made a considerable impression on the Prince of Wales, afterwards George II. In 1716, Mr Wortley, who had made no great figure at home, was appointed ambassador to Constantinople, where his success was not more remarkable. But he took his wife with him to the capital of the Turkish empire, and thus afforded her an opportunity, in her Letters from the Levant, of charming the world with the most luxurious pictures ever yet given of a voluptuous people; and of bringing away with her, in the shape of inoculation for small-pox, a talisman for the preservation of beauty. From these, and indeed from all her future letters, it is clear that her good sense was sound and uncompromising, with an ever-increasing tendency towards universal justice; and that her husband, excepting as holder of the purse, and a person entitled to certain conventional consideration, had already become an individual of no mark or likelihood in her society. Nobody seems to think of him as he travels, except out of delicacy towards his companion. Gallants at Vienna and elsewhere do not see him, nor notice him. Pope makes flagrant love to her in his letters, as if no such person existed; or adds his compliments to the husband, as if the love-making was an affair of perfect indifference to him. Besides Constantinople, Lady Mary and her husband, whilst abroad, visited several parts of Germany; and on their return sailed through the Archipelago, touched on the coast of Africa, and, crossing the Mediterranean to Genoa, reached home through Lyons and Paris in October 1718. From all these places we have letters of the liveliest, and, considering the time at which she wrote, of the most original description; a traveller so shrewd and observant was till then unknown, and her sex gave to the novelty an additional attraction. The manners of Italy she found peculiarly congenial to her disposition; and accordingly, when, in 1739, she resolved to pass the remainder of her life on the Continent, she betook herself to that country, and remained there until within less than a year of her death.

On her return from the East, Pope prevailed on her to come and live near him at Twickenham. Both were then in the zenith of their reputation, and mutual admiration seemed to give assurance of the stability of their friendship. But a short time sufficed to prove that this anticipation was ill founded. Jealousy of her talents, and a difference of political sentiments, have been gravely assigned as the primary causes of that dislike on the part of Pope, which soon manifested itself with such exasperated and vindictive animosity. But neither of these causes can have had the least share in producing the rupture. To ascribe it to jealousy of her wit is ridiculous, because on this score there neither was nor could be rivalry or competition; and as to difference of political sentiments, Lady Mary's predilections and attachments were the same before as after the quarrel, and hence Pope's hatred of the Whigs could not have had any such influence as has been ascribed to it

Montagu. The real cause appears to have been altogether different. Lady Mary's own statement, the truth of which seems to be borne out by other evidence, was this; that at some ill-chosen time, when she least expected what romances call a "declaration," Pope made such passionate love to her, as, in spite of her utmost endeavours to be angry and look grave, provoked an immediate burst of laughter, from which moment he became her implacable enemy. Now, if "hell has no fury like a woman scorned," it may, by a parity of analogy, be imagined with how deep and black a sense of mortification the poor, misshapen, applauded poet must have felt himself smitten, and all his future recollections degraded, by an ever-present sense of scorn and contempt. To say that he had no right thus to address her, is to say the truth; yet to believe that her manners and cast of character, as well as the nature of the times, and of the circles in which she moved, had given no license, no encouragement, no hope of pardon to the presumptuous declaration, is impossible; and to trample in this way upon the whole miserable body of his vanity and humility, upon all which the consciousness of acceptability and glory amongst his fellow-creatures had given him to sustain himself, and all which, in so weak, fragile, and dwarfish a shape, required so much to be sustained, was not very humane in her ladyship, and assuredly beyond the reach of forgiveness in Pope. On her part, a little pity might have divided the moment with contempt; it was scarcely necessary to be quite so cruel to one who was really so insignificant. On his, the contemptuous laughter which greeted his proposals must have carried a poisonous blight to his heart, and changed into the venom of deadly malice the blood by which it had been momentarily warmed into love. Yet nothing can palliate, far less excuse, the gross and indecent manner in which he indulged his resentment, or the mean prevarication with which he evaded every direct charge of ungrateful behaviour towards those whose patronage he had once servilely solicited.

But it is a relief to turn from the sight of Lady Mary as a beauty and a wit, to consider her in the character of a mother, and, what is more, in that of a public benefactress. On her return from Constantinople, she introduced inoculation for the small-pox into England, through the medium of the medical attendant of the embassy. She had lost her only brother by the disease, which had also destroyed her own beautiful eye-lashes; and she was resolved to give to her family and the world the benefit of a practice which promised to save the lives and to preserve the beauty of millions. With courageous love, she began upon her own offspring, and lived to see her innovation triumphant, though not until it had encountered such an opposition that she almost repented of her philanthropy. But this only enhanced the merit of her perseverance, and the many sacrifices of time and spirit which she consented to make; for she submitted to be hawked about as a sort of nurse and directress, in families which required comfort under the experiment. Her descendant informs us, that when four great physicians were deputed by government to watch the progress of her daughter's inoculation, they "betrayed not only such incredulity as to its success, but such an unwillingness to have it succeed, such an evident spirit of rancour and malignity, that she never cared to leave the child alone with them one second, lest it should in some secret way suffer from their interference." But these must surely have been only a mother's terrors, aggravated perhaps by a little of her own sarcasm and vehemence. At the same time, professional persons seldom evince much favour for discoveries or improvements in their own art originating with others, whom they regard as interlopers; and it is probable enough that, whilst she contrived, by her ready wit, to make the physicians appear very small in their own eyes, they, on the other hand, were fain to assert their own dignity by trying to look big and contemptuous. Montagu.

Lady Mary preserved her supremacy in the world of fashion, and continued to give fresh proofs of her talents, until the year 1739, when, in the month of July, she left England with a resolution to pass the remainder of her life on the Continent. She proceeded at once to Venice; and having determined to establish herself in the north of Italy, she took possession of a deserted palace on the banks of Lake Isco, in the Venetian territory, where she planned a garden, applied herself to the business of a country life, and solaced herself with books sent by her daughter Lady Bute, which in some measure supplied the want of society. It seems probable that one of the causes which drove her from England was the enmity she had kindled up all around her by the license of her tongue and pen, and not any flagrant irregularity of conduct, as some have pretty broadly insinuated. She was always writing scandal. A journal full of it was burned by her family, not without good reason, if, from the quality of some of her published writings, a conjecture may be formed as to the nature of its contents. Her very panegyrics were sometimes malicious; and even Pope himself, with all the temptations of wit and resentment, would hardly have written of her as he did, had her reputation for satirical strictures been less a matter of notoriety. As to her life on the Continent, it seems to have been chiefly passed, as we have already described, amongst books and gardens, not altogether neglecting the cultivation of intelligent society; though evidences occasionally escape her pen of things more in unison with what was alleged of her by her enemies. At the same time it is impossible to attach any credit to the malicious exaggerations of Horace Walpole, or to regard with any other feeling than disgust his portrait of Lady Mary in her old age, painted with all the evil gusto and the coarse plastering of an angry procuress.

On the death of Mr Wortley, which took place in 1761, she yielded to the solicitations of her daughter, and, after an absence of twenty-two years, returned to England, where she arrived in the October of the same year. But her health had suffered much from a cancer she had long concealed, and the fatigues she had undergone in her journey to England tended to exasperate its symptoms; the malady increased rapidly, and, before ten months had elapsed, she expired, on the 21st of August 1762, in the seventy-third year of her age. Notwithstanding this cruel distemper, she bore her sufferings with a spirit the reverse of complaining, and preserved to the last her vivacity of temper and character. Lady Mary Wortley Montagu was unquestionably the most remarkable woman of her time; the presiding female wit in the days of Pope, the benefactress of her species by the introduction of inoculation, and the keen satirist of the fashionable circles. Her poems are indeed little else than wit in rhyme, mere *vers de société;* but her prose is truly admirable; better than accurate, to which it has seldom much claim, it is idiomatical, off-hand conversation, without effort and without inelegance, fresh, racy, and piquant, sparkling with wit, and often equally remarkable for strong sense and sarcastic bitterness. The conventional shows of things could not deceive her; she saw beneath the painted masks which are worn in society, detected much that men and women try to conceal, and fearlessly published her detections. Pity that she did not see a little farther into the sweets of things which are not conventional; that she had not more faith in the heart, as well as in the blood and in good sense; more confidence in virtue, higher aspirations, and more ennobling objects of ambition, than those in pursuing which she wasted her fine powers, and embittered the greater part of her life.

It is unnecessary to specify her ladyship's various productions in prose and verse, or even to refer to the edi-

Montagu. tion of her works published by Dallaway, with a memoir of her life; because the former would lead to needless detail, and the latter has, in a great measure, been superseded by the edition of her Letters and Works, with additional letters and particulars of her life, published by her great-grandson Lord Wharncliffe, London, 1837, in three volumes 8vo. This edition, notwithstanding some inaccuracies, is peculiarly valuable on account of the new matter which has been embodied in it, the new light which it throws upon some parts of her ladyship's character and history, and the perfect candour and fairness with which the noble editor has performed his difficult and somewhat trying task. (A.)

MONTAGU, *Edward Wortley*, only son of the preceding Lady Mary, was born in October 1713, and, in the early part of his life, the object of his mother's most tender regard. In 1716, he accompanied his parents to Constantinople, and, on their return to England in 1718, was placed at Westminster School. Here he gave the first indication of his wayward disposition, by running away, and eluding all search, until about a year afterwards, when he was accidentally discovered at Blackwall, with a basket of fish on his head. In point of fact, he had bound himself, by regular indenture, to a poor fisherman, whom he had served faithfully, making shrewd bargains, and honestly accounting to the fisherman for his gains. Emancipated from this degrading condition, he was again placed at Westminster School; but ere long he absconded a second time, and bound himself to the master of a vessel engaged in the Oporto trade, who, supposing him a friendless boy, treated him with great kindness and humanity. This generous conduct, however, awakened no corresponding feelings of gratitude upon his part; for he had scarcely landed at Oporto when he ran away up the country, and contrived to get employment for two or three years in tending the vines. Here he was at length discovered, brought home, and, on promise of amendment, pardoned; but unhappily with no better effect than before. He ran away a third time, after which his father procured him a tutor, who so far reclaimed him to habits of regularity, that he obtained an appointment in one of the public offices. In 1747, he was elected one of the knights of the shire for the county of Huntingdon; but he does not appear to have in any way distinguished himself as a member of parliament, nor did he long retain his seat, his expenses having so far exceeded his income, that, towards the close of the year 1751, he found it prudent once more to leave England. He proceeded to Paris, where, in a short time, he was imprisoned in the Châtelet for some fraudulent gambling transaction in which he had been concerned; but he soon escaped, or effected his liberation, though by what means is unknown. He published a defence of his conduct, written by himself, in French, against one Abraham Payba, a Jew by birth, who assumed the fictitious name of Roberts; and had it translated into English from an authentic copy, which he transmitted to this country for the purpose. In the parliament which assembled in 1754, he was returned for Bossiney; and, besides some dull communications to the Royal Society, he published a book on the Rise and Fall of the Ancient Republics, the merit of which was afterwards claimed by his tutor, Mr Foster. In a word, he seems to have been the offspring of the perplexity of his father's and mother's first position, the victim of their mistake, and privileged to obtain what excuses and comforts he could get from them; which, to do them justice, they generally afforded, though not always in the best manner, or with the right distribution of blame, and the proper allowance on all sides. His father died in the year 1761, at an advanced age, and, by his will, bequeathed to his son a considerable annuity, at the same time empowering him to make a settlement of L.800 a year upon any woman he might marry, and devising to any son of such marriage an estate in the west riding of Yorkshire. It was this clause which gave rise to a story that he had advertised for a wife, promising to marry any widow or single lady, of genteel birth and polished manners, who happened to be five, six, or seven months advanced in pregnancy. That such an advertisement appeared is certain; but then its publication took place in 1776, within a few months of his death, and at a time when he was abroad, circumstances which render the story somewhat improbable. His mother died in the year 1762, and left him only one guinea. He had offended her irreconcilably. But as his father's bequest had rendered him independent, he took a final leave of his native country, passed the remainder of his life in foreign parts, and died at Padua in 1776. Before his death he realized a remarkable prediction of his mother, by becoming first a Catholic and then a Mahommedan, in which latter character he ended his days, with a turban on his head, a long beard, and, it is alleged, a harem into the bargain. He travelled into the East, and wrote some observations on Pompey's Pillar, as it is called, as well as an account of a journey from Cairo to the Gebel Mokattam, or Written Mountains, in the desert of Sinai. He is also said to have published an Explication of the Causes of Earthquakes, though it has not been mentioned at what time, or in what place. His travels in the East occupied several years, during which he underwent his different religious transformations, and ultimately settled down into Mahommedanism, the ceremonies of which he performed with a punctuality savouring of that peculiar derangement which he more or less exemplified in almost every action of his life. (A.)

Montagu ‖ Montaigne.

MONTAGUE *Island*, one of the New Hebrides, in the South Sea, near Sandwich Island. Long. 168. 37. E. Lat. 17. 26. S.

MONTAIGNE, MICHEL DE, a *philosophe-moraliste*, famous for his book of essays, was born at the castle of Montaigne, in Périgord, on the 28th of February 1533, being descended of an ancient family named Eyghem, originally from England. His father, a brave and loyal squire, who had served in Spain and Italy, where he had cultivated his mind and improved his taste, bestowed much attention on his education, and, in particular, initiated him in the knowledge of languages by a process much less tardy and laborious than that pursued in the schools. The expedient he adopted was to provide his son with a German master, who, being entirely ignorant of French, but well versed in Latin, spoke to him only in the latter tongue, which he consequently acquired as a vernacular language, and, at the age of six, was able to converse in it with tolerable freedom and fluency. Greek was also taught him as a sort of diversion. "Nous pelotions nos déclinaisons," says he, "à la manière de ceux qui, par certains jeux de *tablier* (échiquier), apprennent l'arithmétique et la géometrie." By means equally gentle and attractive, he was insensibly led to acquire some knowledge of science; and, without forcing his inclination, or imposing the necessity of application, his habits were formed, and his powers agreeably exercised. All this care and attention he repaid by the most tender affection for the memory of his father; indeed filial piety is said to have formed a conspicuous trait in his character, though it must be confessed that he sometimes displayed it in a manner sufficiently singular. At an early age he was sent to the college of Guienne, at Bordeaux, then the most flourishing in France, and there he had as masters Nicolas Grouchy, William Guérente, George Buchanan, and Muretus, under whom he appears to have made considerable proficiency. Having completed his studies at the age of thirteen, Montaigne resolved to study law; and although his mind, naturally averse to all constraint, must have been repulsed by the conflicting and complicated mass of consuetudinary ju-

Montaigne.

risprudence with which the tribunals were then surcharged, yet, in 1554, he became a counsellor or advocate at Bordeaux, and continued to practise as such until the death of his elder brother, when he abandoned a profession to which he never had any real liking, and which he appeared afterwards to consider as derogatory. On quitting the bar, for the business of which he had evidently no aptitude, he applied himself to the study of men and manners, and in prosecution of this object travelled through various parts of France, Germany, Switzerland, and Italy, making his observations on every thing curious or interesting in society, and receiving several marks of distinction in the course of his peregrinations. In 1581 he was admitted a citizen of Rome, in which city he then sojourned; and the same year he was elected mayor of Bordeaux, an office in which he seems to have given much satisfaction to his fellow-citizens. In 1582 he was sent on a special mission to court about some affairs of importance, and on the expiration of his mayoralty he was again elected to the same office. In 1588 he appeared to some advantage at the assembly of the states at Blois, and, though not a deputy, took a share in the proceedings, but on what pretence or in what capacity does not clearly appear. During one of his visits to court he received the cordon of the order of Saint Michel, a distinction which he appears to have greatly coveted, though we afterwards find him complaining of the discredit into which it had fallen. Having retired to his family residence, he devoted himself to study; but his tranquillity was disturbed by the civil wars which desolated Guienne; and being driven from his house, he wandered about during six months seeking for his family, and often with difficulty obtaining an asylum amongst those who had shared his hospitality. It appears, from a statement of De Thou, that Montaigne had sought to bring about a reconciliation between the Duke of Guise and the King of Navarre, afterwards Henry IV.; and on his return from Paris, where he had completed the impression of his Essays, in 1588, he was with the historian at Blois when the Duke of Guise was there assassinated. In his old age he was very much afflicted with stone and nephritic colic, which led him to observe that "la mort le pinçait continuellement à la gorge ou aux reins;" but he never could be prevailed on to take physic, in which he had no faith whatever. He died on the 13th of September 1589, and was buried in the church of the Feuillants at Bordeaux, where a monument was erected to his memory. Notwithstanding his constitutional tendency to scepticism, and certain unguarded expressions which seem to intimate an entire extinction of the sentiment of religion, he is said to have died a Christian, probably because he had mass celebrated in his chamber in his last moments, and expired during the elevation of the host.

His reputation as a writer is founded solely on his Essays, which were at one time extremely popular, and which are still read with pleasure by a numerous class of persons, who, pardoning the delusions of self-love and self-deceit, are charmed by the acuteness and originality mingled with good nature and sensibility which he displays, and captivated by the inviting frankness and vivacity with which he unbosoms himself about all his domestic habits and concerns. As a writer, he imparted to the French language an energy which it did not possess before, and which has not become antiquated, because it resides in the thoughts and sentiments rather than in the expression. As a philosopher, his object was to describe man as he is, without reserve and without exaggeration; he studied himself more than any other subject, and recorded his observations with an acuteness and fidelity which have rendered his work an authentic record of many interesting facts relative to human nature. He united in a high degree the powers of observation and reflection, without which the study of man can never be successfully prosecuted; and although there is no doubt much truth in the acute but severe strictures on his character contained in a masterly section of the Port-royal Logic, where his vanity, his self-love, and the indulgent manner in which he speaks of his vices, to say nothing of the use of language indicating a total absence of religious principle and sentiment, are very freely exposed, yet, as Mr Stewart observes, "this consideration, so far from diminishing the value of his Essays, is one of the most instructive lessons they afford to those who, after the example of the author, may undertake the salutary but humiliating task of self-examination." In the first Preliminary Dissertation (part i. section ii.), to which the reader is referred, will be found an exposition of the philosophical merits and defects of Montaigne, not less remarkable for ability and discrimination, than for the fair and equitable spirit in which both are distinguished and appreciated. Montaigne's life was first written by the President Bouhier, and prefixed to a supplementary volume of his works in 1740. (A.)

Montanists ‖ Montauban.

MONTANISTS, certain Christian heretics, who sprang up about the year 171, in the reign of the Emperor Marcus Aurelius. They were so called from their leader, the heresiarch Montanus, a Phrygian by birth; and hence they are sometimes styled *Phrygians* and *Cataphrygians*. Montanus, it is said, embraced Christianity in hopes of rising to the dignities of the church. He pretended to inspiration, and gave out that the Holy Ghost had instructed him in several points, which had not been revealed to the apostles. Priscilla and Maximilla, two enthusiastic women of Phrygia, presently became his disciples; and in a short time he had a great number of followers. The bishops of Asia being assembled together, condemned his prophecies, and excommunicated all those who dispersed them. The Montanists, finding themselves exposed to the censure of the whole church, formed a schism, and set up a distinct society under the direction of those who called themselves *prophets*. Montanus, in conjunction with Priscilla and Maximilla, was at the head of the sect. These sectaries made no alteration in the creed. They only held that the Holy Spirit appointed Montanus his organ for delivering a more perfect form of discipline than that which had been delivered by the apostles. They refused communion for ever to those who were guilty of notorious crimes, and believed that the bishops had no authority to reconcile them. They held it unlawful to fly in time of persecution. They condemned second marriages, allowed the dissolution of marriage, and observed three lents. The Montanists afterwards became separated into two branches; one of which consisted of the disciples of Proclus and the other of those of Æschines. The latter are charged with following the heterodoxy of Praxes and Sabellius concerning the Trinity.

MONTARGIS, an arrondissement of the department of the Loiret, in France. It is 606 square miles in extent, is divided into seven cantons and ninety-five communes, and in 1836 contained 70,281 inhabitants. The capital is the city of the same name. It stands on a hill, at whose foot is the river Loing and the canal of Briare; adjoining is the forest of Montargis. In the year 1836 it contained 7757 inhabitants, who are employed in making cloth, paper, and cutlery. Long. 2. 38. 33. E. Lat. 47. 39. 58. N.

MONTAUBAN, an arrondissement of the department of the Tarn and the Garonne, in France, 595 square miles in extent. It comprehends eleven cantons, which are divided into sixty-two communes, and in 1836 contained 106,799 inhabitants. The chief city, of the same name, and the seat of a bishop, stands on both sides of the river Tarn, which is navigable, and receives the water of another river near it. It is a well-built city, surrounded with walls and ditches, and is the seat of a Protestant university, which

Montbeliard || Montelimart.

has a library of valuable books, and an astronomical observatory. It contains 4000 houses, and 23,865 inhabitants, who are occupied in various manufactures, chiefly of woollen goods, which alone give employment to 15,000 persons. This city was distinguished during the civil wars on account of religion, by its bravery and its sufferings. Long. 1. 15. 46. E. Lat. 44. 0. 50. N.

MONTBELIARD, an arrondissement of the department of the Doubs, in France. It extends over 412 square miles, is divided into seven cantons, and subdivided into 161 communes, containing 58,828 inhabitants. The capital is a city of the same name, situated on the river Leine. In 1836 it contained 5177 inhabitants, who were employed, some in making hosiery, and some as watchmakers. Long. 6. 55. E. Lat. 47. 38. N.

MONTBRISON, an arrondissement of the department of the Loire, in France, extending over 713 square miles. It comprehends nine cantons, which are divided into 138 communes, and contains 124,050 inhabitants. The capital of the arrondissement, as well as of the department, is a city of the same name, situated on the river Bizey, a small stream which joins the Loire. It is an ill-built town, with narrow and crooked streets, and in 1836 contained four churches, and 6266 inhabitants. The chief occupation is making cotton goods and paper hangings. Long. 3. 57. E. Lat. 45. 32. N.

MONTCONTOUR, a town of the arrondissement of Loudon and department of the Vienne, in France, on the river Dive, containing 150 houses, and 1100 inhabitants. It is remarkable for the battle fought at it in 1569, when Henry III. defeated the army of the Hugonots. Long. 0. 10. W. Lat. 46. 50. N.

MONT DE MARSAN, an arrondissement of the department of Les Landes, in France, 1902 square miles in extent. It contains twelve cantons, which are divided into 117 communes, with a population of about 93,292 persons. The capital is a city of the same name, situated at the junction of the rivers Midou and Douze, which, united, run to the Adour. It contains 4082 inhabitants, who subsist by trading in the few productions of the soil. Long. 0. 49. W. Lat. 44. 0. N.

MONTDIDIER, an arrondissement of the department of the Somme, in France. It is 340 square miles in extent, and divided into five cantons, which are subdivided into 144 communes, containing 69,271 inhabitants. The capital is a city of the same name, situated on a hill, at the foot of which flows the river Dom. In 1836 it contained 3790 inhabitants, many of whom are employed in making hats, caps, and hosiery goods. Long. 2. 28. 46. E. Lat. 49. 38. 57. N.

MONTECHIARO, a considerable town of Italy, in the Austrian delegation of Mantua. It is situated on the river Mella, in a fertile district, and contains three churches, a hospital, and 5978 inhabitants, who are employed, some in spinning and weaving silk, and others in manufacturing woollen goods.

MONTEGO BAY. See JAMAICA.

MONTEGULIANO, a parliamentary city of the island of Sicily, in the kingdom of Naples, and province of Mazzara. It was the Eryx of the ancients, where formerly stood the temple dedicated to Venus, the most sensual of all the heathen establishments, of which no trace now remains. The city contains 8172 inhabitants, who produce some excellent wine.

MONTELEONE, a city of the province of Calabria Ulteriore, in the kingdom of Naples, the capital of a district bearing the title of a dukedom. It was destroyed by the earthquake of 1783, but has been since re-established, and now contains 6650 inhabitants, who furnish large quantities of oil and of silk, and weave silk goods.

MONTELIMART, an arrondissement of the department of the Drome, in France, 421 square miles in extent. It comprehends five cantons, divided into sixty-eight communes, and contains 64,612 inhabitants. The capital is the city of the same name, situated at the junction of the river Abron with the Roubrion. It is regularly built, with wide streets, and contains an old castle, about 1000 houses, and 7966 inhabitants, the greater part of whom are Protestants, and have been so for a long period, as in this district the doctrine of John Calvin was first introduced, and thence rapidly spread in France. There are some extensive tanneries, and also several mills for spinning both silk and cotton; and the trade in wine, olives, oil, and raw silk, is extensive. Long. 4. 40. E. Lat. 44. 33. 38. N.

Montella || Montesquieu.

MONTELLA, a city of the kingdom of Naples, in the province Principato Ulteriore. It contains eight churches and a large Franciscan convent, and has 5750 inhabitants.

MONTE MAGGIORE, a town of the kingdom of Naples, in the island of Sicily, and province of Mazzara, thirty-six miles from Palermo. It is situated on the river Torto, on the declivity of a fine mountain, and is moderately healthy. It contains 6100 inhabitants.

MONTE PELOSO, a city, the seat of a bishop, in the province of Basilicata, of the kingdom of Naples, with a cathedral, four churches, four monasteries, and 5834 inhabitants.

MONTEPULCIANO, a city of the duchy of Tuscany, in Italy, the capital of a district of the same name. It contains a cathedral, a Catholic ecclesiastical seminary, and about 2100 inhabitants, who grow some of the best wine of the duchy.

MONTESARCHIO, a city of the kingdom of Naples, in the province of Principato Ulteriore, on the great road from Puglia. It contains seven churches, and 5573 inhabitants, whose chief trade is in corn.

MONTESQUIEU, CHARLES DE SECONDAT, BARON DE, the celebrated author of the *Esprit des Loix*, was descended of an ancient and noble family of Guienne, and born on the 18th of January 1689, at the castle of La Brede, near Bordeaux, where he passed his early days, and composed those works which have acquired for their author an imperishable reputation. His father having early discovered in him indications of genius, and a promise of future eminence, bestowed the utmost pains on his education, which appears to have been conducted with equal judgment and success; and being destined for the magistracy, he employed the energies of his active mind in studying the immense collection of the different codes, and in endeavouring to detect the motives and unravel the complicated relations of the obscure or contradictory laws contained in them. His taste for this study was insatiable; and if it proved the source of his future glory, it was also that of his greatest happiness. He has himself stated, that he never had to reproach himself with an hour of reading wasted or mis-spent. He recruited his mind with books of history and travels when exhausted with his arid labours upon jurisprudence, and had a high relish for the productions of the classical ages of Greece and Rome. Enchanted, as he says, with antiquity, he, at the age of twenty, composed a work, in the form of letters, wherein he sought to prove that the idolatry of the pagans did not appear to deserve eternal damnation; but this first production of his genius he wisely abstained from giving to the world. On the 24th of February 1714 he was received as counsellor to the parliament of Bordeaux, and, on the 13th of July 1716, he was, through the influence of his paternal uncle, named president *à mortier*. The same year he was admitted into the academy of Bordeaux, which had been recently founded by a number of persons possessing a common taste for music and works of entertainment. Conceiving, however, that its object was too limited, and desirous to extend the sphere of its utility, he undertook to convert this coterie of wits into a learned

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society; and his views in this respect were warmly seconded by the Duke of La Force, who founded a prize, and held out several other inducements to the cultivation of science. Montesquieu thought with D'Alembert, that an experiment well performed was preferable to a feeble discourse or a bad poem; and having succeeded in impressing others with the same conviction, he thus became instrumental in establishing at Bordeaux an academy of sciences. As a member of this learned association, he contributed his contingent of memoirs or communications, chiefly on subjects connected with natural history, a species of study for which he had a particular taste. But his physical constitution disqualified him for that minute observation which is essential to the successful prosecution of this particular science. He was not only short-sighted, but his vision was weak; and this infirmity increased so much with time, that, towards the close of his life, he became almost blind. It may also be observed, that, at the period when Montesquieu applied himself to natural history, the fundamental principles of that science had not yet been established. In 1719, he circulated, by means of the journals, an *Histoire Physique de la Terre ancienne et moderne;* and he read successively to the academy of Bordeaux a dissertation *Sur la Politique des Romains dans la Religion*, an *Eloge du Duc de La Force*, and a *Vie du Maréchal de Berwick*, a production which in several points recalls the manner of Tacitus.

Montesquieu, however, was by no means in haste to appear before the public in the character of author. He preferred waiting until his faculties were ripened by time and matured by reflection; nor was it until the year 1721 that he entered upon his literary career, by the publication of the *Lettres Persanes*, the first idea of which seems to have been borrowed from the *Siamois* of the *Amusemens Sérieux et Comiques* of Dufresny, though, in works of genius, the primary conception is of little moment compared with the execution. The success of the *Lettres Persanes*, and the influence which they exercised, were unparalleled. This is to be ascribed to two causes; the circumstances of the period at which the book appeared, and the form, adapted to every class of readers, into which it was cast. Disastrous wars, cruel persecutions, and rigorous seasons, followed by famine and misery, the natural attendants of these scourges, had darkened the close of a reign, during the brilliant days of which the French people, intoxicated with the glory and success of their king, had contemplated their own grandeur as reflected in his greatness and splendour; and even when great public misfortunes had produced general discontent, the habit of obedience and the fear inspired by a monarch whose will neither age nor reverses could bend, preserved a respectful silence around. But no sooner had Louis XIV. descended to the grave than the nation appeared to indemnify itself for the constraint which he had so long exercised over it; and in this it was powerfully seconded by the regent, who had assumed the reins of government. Then libertinism succeeded to devotion, effrontery to hypocrisy, familiarity to respect, audacity to submission. The liberty of saying or writing any thing with impunity led men to examine and to combat all that had been agreed to without opposition, or even assented to with enthusiasm. In the midst of the general effervescence thus produced appeared the book of the *Lettres Persanes*. From the shape into which it was cast, it had all the attractions of a romance; it abounded in voluptuous details, which flattered the taste of the age for pleasure, and in irreligious sarcasms, which gratified its tendency to infidelity; and it treated with contempt Louis XIV. and his reign, which people now sought to depreciate. But it must nevertheless be admitted, that, with all these faults, the book displays an ardent love for the welfare of mankind; a courageous zeal for the triumph of reason and virtue; luminous views upon commerce, public law, criminal jurisprudence, and the dearest interests of nations; a penetrating insight into the vices of society, as well as those of governments; and, generally, strong evidence of profound reflection, which takes the reader the more by surprise that it seems to be the constant object of the author to disguise it under the mask of frivolity. Its principal attraction, however, and that which won the suffrages of all, consisted in the keen, animated, sprightly satire of French manners and caprices, and in a style always lively, sparkling, full of happy innuendoes and unexpected contrasts, the pointed irony of which sometimes rose to the most energetic eloquence.

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Four years after the publication of the *Lettres Persanes*, Montesquieu caused to be printed separately, in 1725, the *Temple de Gnide*, an ingenious trifle, though cold and without interest, being equally devoid of easy wit or natural grace, and which Madame du Deffant happily called the Apocalypse of Gallantry. It appears, by a letter written long after the publication of the *Temple de Gnide*, that the author declined to acknowledge this slight production, which he had composed for the amusement of some friends, in whose society he was accustomed to mingle at the house of a lady of his acquaintance. The same year, at the opening of the parliament of Bordeaux, he delivered a discourse on the duties of magistrates, advocates, attorneys, and all those connected with the administration of law; which, though but little noticed, is written in a flowing style and full of unction, different from the ordinary manner of Montesquieu, and in that vein of eloquence which addresses itself more to the sentiments than to the reason of men. In 1726, he sold his office and withdrew from the magistracy, the duties of which he had so well described. The desire to regain his freedom, and apply himself entirely to philosophy and letters, was no doubt one of his motives; but the principal cause of this determination seems to have been a sense of inadequacy to fill the situation in which he was placed. That continual presence of mind, that prompt and ready judgment, that attentive patience which traces throughout all its details the subterfuges of private interest, and that facility of elocution which displays truth and justice the instant they are discerned, rendering them at once triumphant; in these qualities, so indispensable in a judge, Montesquieu was, by his own account, entirely deficient. He informs us, indeed, that his whole merit as president consisted in rectitude of purpose, and understanding sufficiently the questions themselves; but that he had never been able to master the forms of procedure, although he had applied himself to the subject.

Being now at liberty to devote himself exclusively to philosophy and letters, he presented himself as a candidate for the place in the French Academy, vacant by the death of M. de Sacy; but Cardinal Fleury wrote to the academy that the king had declared he would not give his approbation to the author of a work containing impious sarcasms against religion. Montesquieu, however, though at once amazed and offended by the refusal of the king and his minister, contrived, by a little address, to propitiate the cardinal; he asserted his claim with firmness and dignity, yet disavowed those letters of the book which formed a legitimate ground of objection against him. The king was appeased by the intervention of the minister, and, on the 24th of January 1728, he was received into the academy, on which occasion he delivered an inaugural discourse, which is printed amongst his works. Montesquieu having accomplished this object, resolved to travel, and, in the course of his peregrinations, visited almost all the countries of Europe. He proceeded first to Vienna, where he often saw Prince Eugene; he then passed into Hungary, whence he journeyed to Italy, and at Venice became acquainted with

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John Law of Lauriston, who, from the height of grandeur, wealth, and celebrity, had fallen into obscurity, neglect, and poverty, and also with the Count de Bonneval, who had as yet only gone through part of the cycle of his romantic adventures. From Venice he proceeded to Rome, where he became acquainted with Cardinal Corsini, afterwards Clement XII., and with Cardinal Polignac, author of the *Anti-Lucrèce*. He next visited Genoa, but having met with a cold reception there, he soothed his ill humour by writing some satirical stanzas, which, however, he did not think fit to print. From Italy he passed into Switzerland, and traversing the different countries watered by the Rhine, stopped some time in Holland, where he met Lord Chesterfield, with whom he had become acquainted at Venice. He then visited England, where he resided about two years, was admitted a member of the Royal Society, and treated with marked distinction by Queen Caroline. On his return to his own country, he retired to his castle at La Brède, where he resumed his favourite pursuits. He had either before or during his travels caused to be printed in Holland a little work entitled *Réflexions sur la Monarchie universelle*, which is now but little known, and extremely rare, though it is referred to by the author himself in a passage of the *Esprit des Loix*.[1] The object of this piece was to prove that, in the actual state of the modern nations of Europe, it is impossible even for the ablest and most ambitious of sovereigns to establish an universal monarchy.

After two years spent in his retreat at La Brède, Montesquieu published, in 1734, his *Considérations sur les Causes de la Grandeur et de la Décadence des Romains;* a work which, if not the most remarkable, is perhaps the most finished of all his productions, and in which he had to enter into competition with several eminent men, both amongst the ancients and the moderns, particularly Polybius, Machiavelli, Saint-Evremond, and Bossuet. But Polybius, though a learned geographer, a skilful warrior, an adroit negociator, and a profound thinker, was a prolix historian and an indifferent writer. Machiavelli had selected certain facts of Roman history, rather as examples than as the principal subject of his reflections on politics. Saint-Evremond, full of ingenious views, but deficient in general information, and not very intimately acquainted with facts, has left his judgments imperfect and his analyses incomplete. Bossuet, having to consider the history of the Romans merely as a portion of that of the world, has contented himself with an outline embracing only the principal points. Montesquieu is the first writer who has grappled with this great subject in all its details, and who compared all the facts with laborious sagacity. He has overlooked none which can afford matter for reflection, or warrant any inference of importance, and yet he has managed to compress the whole into a volume of moderate thickness. The *Dialogue de Sylla et d'Eucrate*, which is subjoined to this work, and may be considered as forming part of it, is one of those productions in which Montesquieu has displayed the greatest eloquence; and with this may be classed another piece not less remarkable, namely, *Lysimaque*, in which he has delineated, in a manner altogether sublime, that system of stoicism which raised man above the ordinary weaknesses of his nature, and enabled him to brave with joy, and even with pride, the cruelties of tyrants and the iniquities of fortune.

The Considerations on the Grandeur and Decline of the Romans make us acquainted with the history of a single people; but Montesquieu had long been engaged in studying that of all other nations, in discovering the causes of those revolutions which had successively changed the face of the world, and in investigating those laws and customs which had contributed to their prosperity or decline. The success of the treatise on the Roman people, which in some sort formed only a detached portion of the vast plan he had conceived, served to increase his ardour in the execution of so great an undertaking, to the completion of which fourteen more years of incessant labour were devoted. Sometimes he thought that he advanced rapidly, and would speedily accomplish his design; at other times he appeared to recede, and to become perplexed by the immensity and complication of the subject. At length, after twenty years of unremitting application, he had the satisfaction to put the last hand to a production upon which he had expended so much anxious labour and meditation, and which he entitled *L'Esprit des Loix*. But before sending this work to the press, he judged it prudent to consult one of his intimate friends, whose talents and knowledge he respected; and with this view he sent his manuscript to Helvetius. The latter, however, was so little satisfied with the production after perusal, and so much alarmed for the danger to which the reputation of Montesquieu would be exposed by the publication of a work which he considered as so defective, that at first he did not venture to express what he thought of it, and solicited the author's permission to communicate the manuscript to a common friend, Saurin, the author of *Spartacus*. The latter coincided in opinion with Helvetius, and both agreed that, by the publication of this book, the celebrated author of the *Lettres Persanes* would injure his reputation, and lower himself in the estimation of the world. After some hesitation, this extraordinary judgment was communicated to Montesquieu, accompanied with an earnest entreaty on the part of both that he would subject the whole to careful revision, and upon no account publish the work in the crude and imperfect state in which it then appeared. The strange counsels of these friends, however, had so little influence on Montesquieu, that he sent the manuscript to the press without altering a word, prefixing this epigraph, *Prolem sine matre creatam*, to indicate that his work had no model; and, as if to mark still more strongly how little he was moved by their unfavourable judgment, he congratulated himself, in his preface, on having produced a work which was not altogether destitute of genius. Nor did the result disappoint the just expectations he had formed. Its success was in fact so great, that in little more than a year and a half after its publication, it had gone through twenty-two editions, and been translated into almost every language of Europe. The *Esprit des Loix* appeared about the middle of the year 1748, and before the end of the year 1750 its reputation was universal.

If the Spirit of Laws, however, was much read, much admired, and much praised, the work, like all those which have produced a great impression, was also much criticised. Madame du Deffant said of it, that it was not *l'esprit des loix*, but *de l'esprit sur les loix*, a saying which had just that degree of truth which gives currency to an epigram. Those who penetrated to a greater depth, and understood the difficult questions he had treated, perceived that, although the author had refuted some paradoxes of the Abbé Dubois, he had himself fallen into grave errors; that not having sufficiently examined the foundations of the feudal system, he had conceived too favourable an opinion of that form of government; that in order to establish certain principles, he

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[1] This reference is contained in a note to book xxi. chap. 22, tom. ii. p. 274, of the edition of Lequien, and is in these terms: "Ceci a paru, il y a plus de vingt ans, dans un petit ouvrage manuscrit de l'auteur, qui a été presque fondu dans celui-ci." The *Esprit des Loix* appeared in 1748; and if the words "il y a plus de vingt ans" be exact, this little work must have been written about the year 1727, or perhaps a little earlier.

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drew his examples from suspected travellers or discredited authors; that from particular instances he too frequently deduced general conclusions; that a certain degree of neologism and obscurity appeared in his definitions, and an uncommon use of the ordinary words of language in the enunciation of the fundamental principles of his theory. He was also censured for having attributed to the influence of climate and to physical causes effects which are due solely to moral causes; for having frittered down some subjects into small chapters which have often insignificant or indeterminate titles; for having brought together others which have little or no connection with those which precede and follow them; and for being often so deficient in method and arrangement, that his work, as a whole, is irregular, although many of the parts are exceedingly fine, and that it appears to be in some sort an admirable collection of fragments, made for the purpose of being afterwards arranged and moulded into a regular and systematic form. Lastly, he has been charged with some confusion of ideas, certain forced turns of expression, and a style sometimes strained, and frequently laboured. But although these criticisms appear to be well founded, the reputation of Montesquieu was greatly enhanced by the publication of the Spirit of Laws; and it may be said with truth, that this work alone would have been sufficient to insure him lasting renown, and to constitute a noble monument of his genius, sagacity, and wisdom. For some observations equally liberal, profound, and discriminating, on the work in question, the reader is referred to the first Preliminary Dissertation (part i. sect. iii. p. 94, et seq.).

Montesquieu had resolved not to reply to any of the criticisms which might be made on the *Esprit des Loix;* but the attacks of an anonymous author, who, in a journal called *Nouvelles Ecclésiastiques*, had, amongst other things, represented him as an atheist, induced him to deviate from this resolution. In the *Lettres Persanes* he had treated the Christian religion with too much levity; but afterwards, when his mind was fully matured by age, study, and reflection, he had seen cause to alter his views; and hence, in the *Esprit des Loix*, he recommends Christianity in expressive terms, not only as the most perfect of all religious systems, but also as the most powerful support of the whole social system. He therefore deemed it of importance to repel the calumnious insinuations of the ecclesiastical journalist; and at the same time he wished to refute by anticipation the theologians of the Sorbonne, who, being dissatisfied with some passages in the *Esprit des Loix*, were proceeding to condemn the work. It was with this double purpose that he wrote his *Défense*, which may be considered as a model of solid discussion, light pleasantry, and contemptuous moderation. "What pleases me in my *Défense*," said he, "is not seeing the venerable theologians gravelled; it is seeing them laid gently upon their backs." But he took no notice whatever of a crowd of *brochures*, filled with absurd criticisms or gross abuse, which appeared against the Spirit of Laws. The public, said he, avenge me on the one by their contempt, and on the other by their indignation.

The appearance of a book like the Spirit of Laws naturally formed an epoch in political and literary history; but its effect was different in different countries, being greatest in Britain, where it obtained a reputation, which has since continued to increase, and least in France, where its influence was and still is but small. This may be accounted for partly from the different circumstances in which these countries were respectively placed, and partly also from the fact that, whilst Montesquieu pointed out the hazards to which the British constitution was exposed from the incessant conflicts of a tyrannical oligarchy and a turbulent democracy, he had confined his researches to the dark ages of the French monarchy, in regard to which his efforts were doubtful, and his conclusions disputed. But if his work did not prove as useful to his country as he had hoped, the reputation which he acquired in his lifetime far exceeded that which men of letters can ordinarily aspire to obtain. He was considered throughout all Europe as the legislator of nations, and the founder of the philosophy of jurisprudence and politics. But, far from being dazzled by this high reputation, he continued to live like a sage, and to enjoy the society of his friends, dividing his time between his castle of La Brède and Paris, that is, between study and the world. In the country, he occupied himself with gardening and agricultural improvements, and, though jealous of his seignorial rights, was much beloved by the peasantry, whose comfort and happiness it was his object to promote. In the capital he was always a welcome guest, although simple and somewhat negligent in his dress, as well as in his conversation. He was always disposed to render justice to talents, and to relieve merit in distress. One day he received from Henry Sully, an English artist, who had greatly contributed to improve horology in France, the following letter: "I am tempted to hang myself, but I believe nevertheless that I should not do so if I had an hundred crowns." To this Montesquieu immediately replied: "I send you an hundred crowns, my dear Sully; do not hang yourself, and come to see me."

Montesquieu.

Although in some of his opinions Montesquieu inclined to the sect of the philosophers, like Buffon, and Duclos, and many others, yet he kept aloof from the men, because he loved neither the proselytism of impiety, nor the excesses of the spirit of cabal. Nor was this the only cause of his estrangement from Voltaire. Being in a great measure insensible to the charms of verse, he thought the reputation of that celebrated man usurped, and did not hesitate to express his opinion to that effect; whilst Voltaire, on the other hand, was by no means sparing in malignant reflections and bitter criticisms. In fact, they mutually accused each other of having too much wit, and frequently abusing it in their writings. But Voltaire had an exquisite sense of literary merit, which triumphed over his strongest antipathies; and, under its benign influence, he did justice to the author of the Spirit of Laws, by observing, that when the human race had lost their titles, Montesquieu found and restored them; a fine thought, notwithstanding the epigrammatic form in which it is expressed. But whatever might be his sentiments in regard to Voltaire and the other men of letters of his time, it was only in conversation, or in the intimacy of familiar intercourse, that he allowed the secret of his opinions to escape; he never wrote against any of his contemporaries, and conducted himself with a dignity and wisdom which were the effect of the moderation of his passions, as well as the result of reflection. At the solicitation of D'Alembert and the Chevalier de Jaucourt, Montesquieu, having completed the *Esprit des Loix*, consented to write for the *Encyclopédie*, and composed for that work the *Essai sur le Goût*, some inedited chapters of which were afterwards published in the *Archives Littéraires* (tom. ii. p. 301).

It appears that soon after the publication of the *Esprit des Loix*, his physical strength diminished rapidly, and no longer corresponded to his ardour in literary pursuits. He had conceived the design, as he informs us in his journal, of giving greater extension and depth to several parts of the Spirit of Laws; but he found that he had become incapable of carrying his intention into effect. "Mes lectures," says he, "m'ont affaibli les yeux; et il me semble que ce qu'il me reste encore de lumière, n'est que l'aurore du jour où ils se fermeront pour jamais." And in fact he died soon afterwards, on the 10th of February 1755, at the age of sixty-six, that is, only seven years after the publication of his great work. He was attacked at Paris with a violent inflammatory fever, which, in spite of every effort to arrest

Montesquieu ‖ Monte Video.

its progress, carried him off after an illness of about a fortnight. But the benignity of his character sustained him to the last moment; no complaint, no sign of impatience, escaped him. He knew from the first that he was in imminent danger, and occasionally asked his physicians, "Comment va l'espérance à la crainte?" The Jesuits tried to gain him over in his last moments, and, with this view, sent to him Fathers Routh and Castel, who were accused, most probably with injustice, of exercising their ministry with undue importunity. He observed to them, "I have always respected religion; the morality of the Gospel is the finest present which God has made to men." As the Jesuits pressed him to put into their hands the corrections he had made on the *Lettres Persanes*, that the irreligious passages might be effaced, he refused to comply with their request; but he afterwards placed the manuscript in the hands of the Duchess of Aiguillon and Madame Dupré de Saint-Maur, saying, "I wish to sacrifice everything to religion, but nothing to the Jesuits; consult with my friends, and decide if this ought to appear." Nevertheless, he received the viaticum from the hands of the parish priest, who, at the same time, observed to him, "Monsieur, vous comprenez combien Dieu est grand;" "Oui," replied the dying philosopher, "et combien les hommes sont petits."

Montesquieu left a great number of manuscripts. They consist of, 1. A little romance. entitled *Le Métempsycosiste*, by no means worthy of the author of the *Lettres Persanes;* 2. Morceaux qui n'ont put entrer dans *l'Esprit des Loix*, et qui peuvent former des dissertations particulières, amongst which are one on Paternal Authority, another on Verbal Obligations, and a third on Successions; 3. Three large volumes in quarto, bound, consisting of extracts made by him in the course of his reading, with reflections annexed. In these volumes there are several original pieces of considerable extent. particularly a sort of introduction to the history of Louis XI., which is considered as equal to any thing that Montesquieu ever wrote. In this fragment, he commences by tracing a general view of the political situation of Europe when Louis XI. mounted the throne; he shows that it was eminently favourable to this king, and that what has been commonly ascribed to his ability was only the necessary result of the circumstances in which he was placed; he then points out the great things which he might have achieved, but did not perform, adding that, in the beginning of his reign, Louis saw nothing but the commencement of his vengeance; he next describes the horrible cruelties which accompanied the last years of the reign of this tyrant; and he ends by drawing a parallel between Louis XI. and Cardinal Richelieu, which is altogether to the advantage of the latter, of whom it is observed that he made his sovereign play a second part in the monarchy, but the first in Europe, that he degraded the king, but illustrated his reign. The importance of this fragment cannot fail to increase our regret that the history to which it was intended to serve as an introduction, and which is believed to have been completed by Montesquieu, should have been destroyed, as is said, by the carelessness or stupidity of his secretary. But those who are best informed in regard to all that concerns Montesquieu are of opinion that the account commonly given of the destruction of the manuscript is apocryphal, being at variance with the known habits of the author, who was particularly careful in preserving not only the rough draughts, but even the materials which he had employed in the composition of his works. He is said to have written an Account of his Travels, which, if it exists at all, must be in a very imperfect state; and as to the *Notes sur l'Angleterre*, inserted in some of the last editions of his works, we know not whether they were extracted from the materials which he had prepared for the *Rélation de ses Voyages*.

Monte Video.

Montesquieu has said of Tacitus, that he abridged every thing because he saw every thing. This fine eulogium has been applied to Montesquieu himself, and these great men have often been compared. But geniuses of this order have each a particular character of originality, which invalidates such comparisons, and falsifies all the similitudes that are sought to be established between them. Were it necessary to determine the precise degrees of preeminence which distinguish Tacitus and Montesquieu, it might be said that the French surpasses the Latin author in the variety and extent of his knowledge, in the grandeur of his conceptions, and in the abundance of his thoughts, but that he yields to the Roman in respect of talent and eloquence; that, in a word, he is greater as a philosopher, but inferior as a writer. Tacitus invariably sustains the dignity of his expressions on a level with the importance of his subject; he impairs not the gravity of his style by ingenious antithesis; and he is careful never to enervate his energetic phraseology, nor to enfeeble the vigour of his narrative, by the graces of wit or the artifices of rhetoric. His penetration and sagacity, fortified by the study of severe models, no less than by his own natural character, saved him from the commission of such faults. But it is not so with Montesquieu, of whose manner as a writer, if we desired to convey an idea by referring to ancient examples, we should say that it consisted of several of the finest qualities of Tacitus, and many of the brilliant defects of Seneca. (A.)

MONTE VIDEO, Cisplatino, or Banda Oriental, a tract of country in South America, which for some time was the subject of an obstinate war between Brazil and the united provinces of La Plata. It has Brazil on the east and north-east; on the west and north-west it is separated from Entre Rios and other provinces of La Plata, as also from Paraguay, by the river Uruguay; and on the south it is washed by the Atlantic and the Rio de la Plata. It is somewhat of a conical form, rounded at the bottom, and bending to one side towards the apex, which is situated in latitude 27° 30′ south. At the broadest it extends over five degrees of longitude; and Monte Video, the capital, which lies nearly in the centre of the base, is situated in latitude 34° 50′ south, and longitude 56° 20′ west. It received its name of Banda Oriental from its position with respect to the Uruguay; but this was changed to Monte Video when it was erected into an independent republic.

This country, the first which salutes the eye of the European traveller on entering the Rio de la Plata, is equally distinguished for salubrity of climate, fertility of soil, natural beauty, and geographical position. In these respects it is superior to any of the provinces of La Plata, or the republics of Buenos Ayres and Brazil. Fertility is indeed characteristic of the whole of these countries, but the land is exceedingly flat and monotonous. The surface of Monte Video, on the contrary, is diversified by an endless variety of hills and valleys; and yet scarcely an unproductive spot is to be found. A Spanish traveller thus speaks of it: "The whole country abounds in excellent pastures, and not a single spot of ground is left waste. The pastures are of excellent quality, and fertilized in an astonishing manner by the irrigation of many rivers, rivulets, and springs. At each step the traveller finds himself agreeably surprised by meeting with streams of pure and salubrious water, which tend to enhance the charms of the surrounding scenery, consisting of a constant succession of hills, eminences, meadows, wilds, rugged defiles, and mountains, with which all the territory abounds." The principal river is the Uruguay, which rises amongst the mountains of Brazil, and, after traversing the province of Rio Grande, sweeps past the north-western and down the western limits of Monte Video. It is celebrated for its volume of water, but is only navigable for the space of sixty leagues,

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on account of a slight fall, which, however, might be easily avoided by a regular canal along one of its sides, a work of little difficulty. The most considerable tributary of the Uruguay is the Negro, which is likewise the largest river in the province. It originates in a ridge of hills, which runs northward from Maldonado and Monte Video, and is navigable for some leagues above its junction with the principal stream. The scenery of the Rio Negro is celebrated for its beauty, its banks being delightfully fringed with various shrubs, particularly the sarsaparilla plant, which is reputed at certain seasons to impart medicinal properties to the water. A bend of the river before its junction surrounds a fertile, lozenge-shaped piece of ground, so as nearly to isolate it. This is called Rincorn de Gallinas, and it was found extremely useful during the war as a place of refuge for the cattle, a dike having been run across the narrow isthmus. The Gualeguay is a river of nearly the same size as the Negro. The other streams of note are the Ybicui, Cibollati, Yi, St Lucia, Guegisay, Diaman, Arapei, Guarey, Olimar, Pardo, Tacuari, Yguaron, and Tacuarembo. The immense currents of these rivers are formed by a multitude of rivulets, many of them very considerable, which run in all directions, excepting an elevated ridge of land which crosses the whole country, and is called *Cuchilla Grande*. Almost all these rivers might be rendered navigable with little trouble throughout the greater part of their courses. Those that are easily navigated, besides the two already mentioned, are the Ceballati and St Lucia. For ten or fifteen leagues from the banks of all the principal rivers, the country has been occupied by grazing farms; but the centre and northward portion of the province is wild, and covered with wood; and northward, beyond latitude 30°, the trees acquire considerable magnitude, and are suitable for all purposes of house and ship building. These are floated down the Uruguay, and, when the river is full, pass over the falls of Salto Grande and Salto Chico without difficulty. As the grazing business produces such immense profit to those who possess capitals laid out in estates, of which there are some of immense size, agriculture as a speculation has occupied but little attention. The soil, however, is capable of producing abundantly, and almost without labour, all kinds of grain, fruit, and vegetables. A traveller thus speaks of the climate and the productions of Monte Video: "The fruits, peaches, grapes, figs, oranges, apples, &c. are exceedingly fine. In this enchanting climate, with the exception of a few of the tropical fruits, all the fruits most esteemed ripen in great perfection in the open air. In fact, I believe that the climate is surpassed by none in the world, not even by that of Italy or the south of France. It experiences neither the sultry heat of summer nor the chilling blast of winter."[1]

The city of Monte Video, the capital of the republic, is situated on the northern bank of the Rio de la Plata, near its mouth, 120 miles north-east from Buenos Ayres, in latitude 34° 50′ south, and longitude 56° 20′ west. It is built on a small peninsula, which projects forwards, and constitutes the eastern boundary of the harbour. On the opposite isthmus a strong fort is erected, and the town is still further secured by a wall and ditch, and several minor forts. On the opposite side of the harbour rises the hill of Monte Video, also surmounted by a fort, which, along with those already mentioned, commands the harbour. The town rises gradually from the harbour, and presents a handsome appearance as it is approached from the shore. Like Buenos Ayres and other places built by the Spaniards, Monte Video is disposed in regular squares all nearly of a uniform size. The streets are wide, well paved, and cross each other at right angles. There is a plaza about 150 yards square at the upper end of the town, the west side of which is occupied by the cathedral, a large and handsome brick edifice, surmounted by a cupola, covered with glazed tiles; and on the east side is the barracks. The houses are chiefly one story in height, and are built of stone or brick, with flat roofs without chimneys. The better sort of houses are generally built round a square area or court, the sitting rooms being on the side next the street, the lodging rooms in the two wings, and the inferior apartments at the back. Provisions here are cheap and in great abundance. Monte Video is a most excellent position for commerce. It is central for collecting and exporting the produce of the province, and for distributing the goods imported in return. It is also very superior to Buenos Ayres as an intermediate port for the transhipment of goods from the larger vessels which arrive from distant countries into smaller vessels fitted to navigate the Parana and Uruguay, because the channel of deep water runs along the north side of the Rio de la Plata. Indeed, from various circumstances, this port is the best on the Plata. The exports consist of tallow, hides, and salt beef; and the imports are manufactured goods, coffee, sugar, and the like. The atmosphere at this place is humid; storms are not unfrequent in summer; and in the winter months, June, July, and August, the cold is sometimes severe. The climate of the capital, therefore, is not equal to that of the interior parts of the country. Monte Video was built by a Spanish colony from Buenos Ayres, and for a long period formed an object of ambition to Portugal. When the former shook off the Spanish yoke, the Brazilian court seized the opportunity of taking possession of it; but it was recovered, after a long siege, in 1814, and retaken by the Brazilians in 1821. By the treaty of 1828 it became the capital of the republic, which was called by the same name. The population cannot be estimated with any exactness; it may be from 15,000 to 20,000.

The place next in importance to Monte Video is Maldonado, which is situated upon a bay of the same name, lying more immediately at the mouth of the river than the capital. By some writers it is considered as preferable to Monte Video for a place of anchorage and shelter. It stands on the brow of a hill, rising gently to the height of 250 feet above the level of the sea. Immediately off the coast lie two islands, Lobos and Gorrete. Under cover of the latter, which stands in the mouth of the harbour, and is noticed for the growth of stick-liquorice, a small number of ships may ride in safety in all weathers. The principal buildings form a quadrangle, on the north side of which is a considerable inn, and on the south side a spacious church; whilst the rest of the square is occupied by common habitations. The houses in the streets issuing from the square, or running parallel to its sides, are chiefly low, and constructed of earth. The whole number is about 250, and the inhabitants amount to about 1000. A place bearing the same name is situated about nine miles from this town towards the north-east, and is said to have been formerly the chief place in the district.

Northward of Maldonado the coast continues low to the Rio Grande, in lat. 32° 15′, in which parallel the Brazilian territory commences. The soil is extremely rich, and, in a ridge of hills which runs northward from the neighbourhood of Maldonado, mines of gold and silver were formerly worked. Proceeding to the westward of Monte Video we meet with several bays and rivers well adapted for the purposes of navigation, to which they will no doubt be applied as the country advances in population. At Colonia, opposite to Buenos Ayres, there is a tolerably commodious

[1] Brackenbridge's Voyage to South America.

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harbour for large ships, which is well fortified. At Las Vacas, a few leagues farther, at the mouth of the Uruguay, there are good anchorage and shelter for small vessels; and the Isle of Martin Garcia, which is near to it, is the rendezvous of ships of war. There are several other towns and villages besides those mentioned, but none of sufficient moment to require particular notice.

Monte Video, having been originally settled by a Spanish colony from Buenos Ayres, fell naturally under Spanish domination, but came at length to be a bone of contention between Spain and Portugal. From its peculiar position it was a prize of no common value to either nation. To Spain it gave the control of both sides of the Rio de la Plata, whilst to the sister kingdom it was necessary to the free and secure navigation of the vast interior expanse of Brazil. During the devastating wars between these two powers, relative to the various boundaries of their immense South American possessions, Monte Video, then the Banda Oriental, was overrun and wasted, sometimes by one party, sometimes by the other; and their respective pretensions were differently regulated by successive treaties. At the commencement of the revolution, the Orientalists, as the inhabitants of Monte Video were then called, naturally joined the government of Buenos Ayres; but in what capacity, whether as a dependent or independent power, has not been made apparent. At all events, when the British were expelled from the Plata, hostilities commenced between the rival cities of Monte Video and Buenos Ayres, during the continuance of which the former suffered severely. For some time the party in the Spanish interest maintained the ascendency, notwithstanding an effort of the Creoles to follow the example of Buenos Ayres, in throwing off the Spanish yoke. In 1810 the government of Buenos Ayres laid siege to Monte Video, which was carried on at intervals, being alternately abandoned and resumed as they were successful or otherwise against the Spanish royalists in the upper provinces, till the close of the year 1814, when the republicans succeeded in capturing the place. During this protracted struggle, all intercourse between the city and the interior was necessarily cut off; and the ruinous effects of this on trade may easily be conceived. But its calamities did not terminate here. Not many months after the establishment of a republican government in Monte Video (the first acts of which were to set up a printing press, and to open schools and colleges), the troops of Buenos Ayres were called off to combat the enemy in the upper provinces; and the city soon afterwards fell into the hands of Artigas, a notorious brigand, and his lawless banditti. Under the guidance of this individual, whose authority was absolute and without the slightest control, the Orientalists gained a victory over the Buenos-Ayreans in 1815, at Gaubiju, and thus made themselves independent of that republic. But the Brazilians soon found a pretext for occupying the country. Pretending an apprehension that Artigas would spread the revolutionary contagion over Brazil, they attacked him, scattered his forces, and compelled him to seek refuge in Paraguay. The Brazilians maintained possession of the Banda Oriental till 1822, when the republic, nominally at least, attached itself to Brazil under the name of the Cisplatine province. That same year Brazil separated itself from the mother country, to which for a time the Orientalists remained true; but on the submission of the royal troops they called upon the Buenos-Ayreans for aid. This was granted, and ultimately the Banda Oriental was formally declared to be united to Buenos Ayres. But the standard of independence having been raised in 1826, war was declared towards the close of that year by Dom Pedro, who entered into an elaborate exposition of the alleged rights of Brazil. Both parties wasted Monte Video, which, whilst it was the cause of quarrel, became likewise the arena where either party attempted to decide it. But their resources were inadequate for enabling them to strike a decisive blow; and the solicitations of Great Britain, which, like other neutral nations, suffered by the war, at length procured a peace, which was signed at Rio in August 1828. By this pacification it was in substance provided that the Banda Oriental should become an independent state, under the mutual guarantee of the two contracting parties. Thus the war, after having drained the resources of both Brazil and Buenos Ayres, ended in a drawn game as to the subject of the contest. From time to time since that period, hostilities have broken out in the various provinces situated in this part of the South American continent; and it will require many years of tranquillity before the great resources of Monte Video are properly developed. According to the official returns of 1835, the number of British and foreign vessels employed in the import trade amounted in that year to 893; tonnage, 89,238; the value of their cargoes amounted to 3,095,398 dollars currency; whilst the exports, as far as the returns have been given, are of the value of 2,765,401 dollars. The political misfortunes with which it has been overwhelmed have greatly retarded the increase of the population, which at present amounts to about 100,000 souls. (R. R. R.)

Montezuma || Montgomeryshire.

MONTEZUMA, or Moctęçuma, emperor or king of Mexico when Cortes invaded that country in the year 1518. See Mexico.

MONTFORT, an arrondissement of the department of Ille Vilaine, in France, extending over 352 square miles, and containing a population of 57,554 persons. It is divided into five cantons and forty-six communes. The capital, of the same name, stands on the river Meu, near its junction with the Chaillon. Its walls are dilapidated, and in 1836 it contained 1772 inhabitants.

MONTGOMERY, a borough and market-town, the capital of the county of that name, in North Wales, 169 miles from London. It is situated on an elevation on the right bank of the Severn. In ancient times it was fortified, and had a castle, the remains of which show it to have been an extensive pile of building, though but a small portion of it is now entire. It is an ancient corporation, and sends one member to parliament, in conjunction with five other towns, viz. Llanidloes, Welshpool, Machynllaeth, Newtown, and Llanfyllin. There is a market on Tuesday, and six annual fairs are held. The population amounted in 1801 to 972, in 1811 to 932, in 1821 to 1062, and in 1831 to 1188.

MONTGOMERYSHIRE, an inland county of North Wales. It is bounded on the east by Shropshire, on the north by Denbighshire and Merionethshire, on the west by Cardiganshire and Merionethshire, and on the south by Radnorshire. It is of an irregular form, its greatest length from north to south being thirty-six miles, and its mean breadth from east to west about thirty-two miles. Its area is estimated at 982 square miles, or 620,720 statute acres; but it is probably overrated.

It is a county of very irregular surface, composed in the centre of a ridge of lofty mountains, which nearly divide it, and whence various branches project, which, though not equal in height to the mean ridge, attain a considerable elevation. The loftiest of the mountains, Plinlimmon, or Pumlumon, is continued through Montgomeryshire, and enters Merionethshire; from its centre various streams run, some to the east and some to the west, the former into the Severn, and the latter to the sea at Cardigan Bay. Plinlimmon is, at the highest point, 2463 feet above the level of the sea; the other mountains which branch from it are, Llandinam, 1898 feet, the Long Mountain, 1330, and that on which a pillar to the memory of Lord Rodney is erected, 1204. From the irregularity of the surface, and the great elevations, the chief part of the county is bare, raw

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and barren; but in the valleys between the mountains there are some most delightful and fertile spots, watered by translucid rivulets, and bordered with the richest forest scenery.

The rivers which run westerly from the mountain ridges are, the Traeth-bach, the Maw, and the Dovey. The Wye, the Severn, the Vyrnwy, and the Tanat, which receive smaller mountain torrents, run to the eastward; the two first, which receive the others, keep nearly a parallel course to the plains of Salop. The Severn, though at first a mere mountain rill, and soon afterwards a rapid torrent, speedily assumes a tranquil character, and glides through deep vales till it enters Shropshire, and becomes the second of our English rivers. It is the only stream navigable in this county, but it is not passable by boats except at periods of rain, and frequently ship timber lies on its banks a long time, waiting for sufficient water to float it down the stream. A canal has been constructed, connected with the Ellesmere Canal in Shropshire; but though completed, it is found to be a very unproductive undertaking. There are some picturesque waterfalls, which invite the inspection of travellers in this romantic county. The most remarkable of these is Pystyll-Rhaïadr. The brook, or rather the river Rhaïadr (for, after rains, it deserves the latter name), runs down a gentle declivity for a short distance, and then suddenly precipitates itself over a perpendicular ledge, whence it falls, rather in the form of spray than in that of a torrent, to the depth of two hundred feet, whilst the projecting rocks which intercept its fall produce a spectacle and sounds that are highly terrific. This cataract appears in its grandeur only after a wet season, for in very dry weather it is an insignificant rill.

The agriculture of Montgomeryshire is in a very backward state; not one eighth of the land is under the plough; about three eighths of it is devoted to pasture, but the food it produces is small for the extent on which it grows. Nearly half the county is in an uncultivated state, or covered with wood. Some few good cultivators have latterly, in some spots, introduced the Norfolk four-course system of turnips, barley, clover, and wheat; but it prevails to a very limited extent, owing to the deficiency of capital amongst the occupiers. The greater part of the arable land is destined to produce corn without intermission till it becomes exhausted, when it returns of itself to a very imperfect and unproductive kind of pasture. Though these remarks refer to the greater part of the county, yet a portion of it adjoining to Shropshire forms an agreeable exception, as it is well cultivated, and very prolific, especially on the banks of the Severn. In almost every part of the county hemp is cultivated for domestic use, in small patches; and the making of it into cloth forms the employment of itinerant weavers.

The cows of this county somewhat resemble the Devonshire breed, and are said to have been originally brought from that county. When removed to better pasture, and fattened, they are highly valued by the butchers, because they yield less offal, and collect a greater mass of flesh on the more valuable parts of the body. The sheep are of small size, but their mutton is exquisite. The wool is of a very fine quality, and the best Welsh flannels are made from it. There is a very numerous breed of small horses in the mountainous parts of Montgomeryshire, which are nearly in a state of nature. They are known by the name of Merlyns, and range during the whole year through the most elevated parts of the country. By their exposure, and the ease with which they are subsisted, they acquire a very hardy frame, and are capable of performing labour far beyond what their size and apparent strength indicate. They are driven, when required, into an enclosure, where the best are selected from those which have attained their third year, and the remainder are turned out to range at large as before. Notwithstanding their diminutive size, the greater part of the commodities furnished by the county are conveyed on their backs from one place to another. The valleys in this county have been long celebrated for a breed of excellent horses, introduced originally from the south of Spain, by the Earl of Shrewsbury, in the reign of Queen Elizabeth. These, by various crosses, have been much improved, and they now furnish some of the best hunters in the kingdom, from uniting strength with speed.

Montgomeryshire.

Limestone is not generally found in this county, and rarely unmixed with argillaceous earth; so that the lime required for building is brought from one extremity to the other by the canal. Coal is only found in an angle of the county, on the borders of Salop; but the quantity is small, and its combustive quality causes it to burn so rapidly as to make it a much more expensive fuel, except in the vicinity of the pits, than either wood or turf.

The mineral which abounds most in the mountains of Montgomeryshire is lead, which is extracted in many parts of them. The ore known by the name of galena, provincially called potters' ore, was formerly discovered in a prodigious vein at Llangynnog; but, after much profitable excavation, the miners reached a fault in the vein, and its continuance has not yet been ascertained. At Llanymynach are the vestiges of mines worked in very remote periods, which exhibit intricate recesses, and form a kind of subterraneous labyrinth. Both copper and lead ore are still found in these ancient mines, and zinc in combination with sulphuric and carbonic acids, known by the common appellations of calamine and black-jack. A very rich lead mine at Tallessi was formerly worked, and yielded large profits to its owner, Sir Watkins Williams Wynne; but, owing to a great increase of water, the working has been discontinued. The ranges of mountains are partly composed of schistus, from which are drawn large quantities of slates, applied to the covering of houses, or sent to London and Bristol to be fitted for writing.

This was formerly one of the best wooded counties of North Wales, and it has, for the last seventy years, contributed to supply a great part of the best oak timber to the royal dock-yards. The size of the Montgomeryshire oaks has made them much prized for naval purposes; some have been felled which have contained more than 600 cubic feet. This oak is of a remarkably good quality; but the difficulty of conveyance has rendered the price very low on the spots where it is grown, and formerly much of even the most valuable quality was used for fuel.

The only manufactures are those of woollens, made from the fleeces of their native sheep, and mostly confined to flannels known through England, and highly prized, under the denomination of Welsh flannels. They have been imitated both in Lancashire and Yorkshire, but have not been equalled in fineness of texture, combined with softness. The farmers, and even the cottagers, make these flannels; and they are collected by a kind of middle-men, who bring them to the market of Welshpool, whence they are sold to the merchants of Shrewsbury, who distribute them over the kingdom. The annual value of those sold at the market is about L.50,000, and the cost of the wool is estimated at about half that amount.

One member is returned to parliament by the freeholders for the county, and one for the towns of Montgomery, Llanidloes, Machynllaeth, Llanfyllin, Newtown, and Welshpool.

The population of this county amounted in the year 1801 to 47,970, in 1811 to 51,931, in 1821 to 66,482, and in 1831 to 65,700. The baptisms in the year 1830 were, of males 656, and of females 644. The burials of males were 498, and of females 506. The marriages were 425. The families were 13,407, of which those chiefly employed in agriculture were 6610; those chiefly employed in

Month ‖ Monti.

trade, manufactures, and handicraft, were 4198; and the remaining 2599 were not comprised in the two preceding classes. The males under twenty years of age were 16,723. The occupiers of land employing labourers were 1938, those not employing labourers were 1610, and agricultural labourers were 5749. Those employed in manufactures, or in making manufacturing machinery, were 1630; those employed in retail trade or handicraft as masters were 3370; the capitalists, bankers, professional and other educated men, were 418; the labourers employed in other than agricultural labour were 976; and the other males twenty years of age, except servants, were 851. The male servants were 311, and the female 3695.

The annual value of the real property, as assessed in 1815, amounted to L.207,286.

The most remarkable seats of noblemen and gentlemen are, Powis Castle, Lord Powis; Lydiarth Hall, Sir W. W. Wynne, Bart.; Llangedwen, Mr Wynne; Towyn, E. Corbet, Esq.; Llandinam, M. Stephens, Esq.; Vayner, Captain Windus; Newton Park, Richard Shaw, Esq.

MONTH, the twelfth part of a year. See CHRONOLOGY and CALENDAR.

MONTI, VICENZO, the greatest poet which Italy has produced since the bright days of its literary glory, was born in Romagna, on the 19th of February 1754. His father was one of those small Italian landholders whose mode of life is peculiarly primitive and patriarchal, and the farmhouse, or villa, as it is called, which he occupied, was situated amongst the vineyards and agricultural country which lies between Fusignano and the Alfonsina, in the territory of Ravenna. In this rural retirement Monti passed several years of his boyhood, without receiving any instructions except from his parents; but the family having removed to Majano, he was sent to the seminary of Faenza, and there he acquired an extensive knowledge of the Latin language. His first attempt in Latin verse was singularly unhappy; but his attachment to the Roman poets amounted to a passion, and the second effort of his muse was regarded by his masters as a miraculous effort of precocious genius. By his father he was destined to follow the profession of agriculture; but yielding a reluctant compliance with the wishes of his parent, and continuing to evince a predilection for literature which was subversive of all manual application, the elder Monti sent the youthful poet to the university of Ferrara to study the legal or medical profession. Yet even these pursuits were found too abstract for a mind so highly imaginative and ardent, and ultimately Monti resigned himself wholly to the cultivation of literature and poetry. His first Italian poem was entitled The Prophecy of Jacob; and, although an unequal production, it contains some vigorous and even sublime passages. About this time, the perusal of Dante opened up to him new and splendid views of the grand and beautiful in the poetry of his native land, and henceforth the bard of the Divina Commedia became his model and his master. His admiration of Dante bordered on idolatry, and catching a portion of the inspiration of his favourite, he wrote the Vision of Ezekiel, in which he displayed that grandeur of imagery and command of language which distinguish his compositions. Monti was at this time scarcely eighteen years of age.

His genius attracted the notice of Cardinal Borghese, who took him under his protection, and conducted him to Rome. Here he extended his knowledge of the classics, and his acquaintance with the learned, whose favour he secured by various efforts of his muse. But it was not until he attained his twenty-sixth year that public attention was directed to him, on the occasion of the celebration of the quinquennali of Pius VI. in 1780. The compositions which he recited drew forth such general applause that the Duke of Braschi, the pope's nephew, made him his private secretary. Under this nobleman he continued several years at Rome, producing at intervals such occasional poems as kept alive rather than extended his poetic reputation. At last the fame of Alfieri inspired him with emulation; and burning with a desire to rival Virginia, which he had heard read by the poet in a circle of the most distinguished literati of the day, he composed his tragedy of Aristodemo. It was acted with the greatest success at Rome in 1787, and Monti was induced to write another drama, Galeotto Manfredi, which proved an entire failure. His genius was not dramatic, but lyrical; and highly-wrought imaginative rhapsodies were more in accordance with the natural bias of his mind than the concatenation of plots, and the delineation of human passion. About this period Monti married.

Monti.

The French revolution had now begun to shake, as if by an earthquake, the time-worn and decayed governments of Europe; and the French, eager to extend the moral convulsion, and regenerate the whole world, despatched numbers of individuals to different countries, there to spread revolutionary tenets. Amongst those who had crossed the Alps for this purpose was Hugh Basseville, a person of considerable talents and some literary acquirements. He had been appointed secretary to the French embassy at Naples; and whilst thus employed he visited Rome, for the purpose of propagating revolutionary doctrines. This imprudence cost him his life. He was stabbed on the night of the 13th of January 1793, and died soon afterwards, overwhelmed with remorse, it is said, for having attempted to raise sedition against the pope. Monti being attached to the papal court, laid hold of this circumstance, and celebrated at once the repentance of Basseville, and the unfortunate tragedy acted in France almost at the same moment,[1] in a poem entitled the Basvilliana. This production is entirely supernatural in its construction. The soul of the murdered man, like the body of Moses, is contended for by the angel of God and the enemy of mankind; and although the former is triumphant, yet the disembodied spirit of the republican is doomed for a certain period to hover about the banks of the Seine, and to witness all the atrocities which are there perpetrated. The subject is treated in a powerful and happy manner, the imagery with which the poem is adorned being in the highest degree original and majestic. As a whole, it approached more nearly to the grandeur and sublime daring of Dante than any thing which had been produced for centuries; and the fame of Monti rose above all rivalry. But the tide of French republicanism, having now rushed through the passes of the Alps, and overflowed the fertile plains of Italy, entirely changed the aspect of affairs in that country, and brought Monti into close contact with some of Napoleon's generals. To this circumstance we must attribute the admiration which the poet began to entertain for the French hero, and the lively anticipations of good to be derived by his country from the new order of things which were awakened in his mind. But the Italian nobility eyed with extreme suspicion the masquerade of liberty in which they were invited to play a part; and many of them, seceding from the offices of government, left these open to the ambition of meaner or less scrupulous aspirants. The enthusiasm of Monti hurried him away with the general current in which so many warm young hearts were borne along. In one of his letters, the poet observes, "I grew insane with the rest, and my conversion procured me patronage and grace;" but it did not procure him either peace or

[1] Louis XVI. was beheaded on the 19th of January 1793.

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respect. By many of his own countrymen he was viewed with envy and aversion, whilst the republicans denounced, in the author of Basvilliana, the arch enemy of democracy, and Monti was ultimately dismissed from his office.

In a mythological poem entitled Musogonia, he paid court to Napoleon; and in a still finer production, Prometeo, he enthusiastically celebrates the triumphs of the Gallic chief, at the same time pouring out the vials of his wrath upon England. This must doubtless have greatly delighted Bonaparte, and the poet was soon afterwards named commissary of the province of the Rubicon; but in a short time he was obliged to resign his office. During the absence of the conqueror in Egypt, the Italian republics melted away like frost-work before the sun; and their partisans, amongst whom was Monti, were compelled to seek refuge beyond the Alps. The poet fell into a state of the most deplorable destitution; but the return of Napoleon, and his new victories in Italy, afforded Monti an opportunity of partially retrieving his fortunes. He returned to Milan, and there published his poem, the Mascheroniana, the chief object of which is to bind new wreaths of victory around the brow of Napoleon, already encumbered with laurels. Shortly afterwards, Monti produced a third tragedy, entitled Caius Gracchus; and, in 1802, an ode, in which he calls upon his military idol to place himself at the head of the Italian people, which, as is well known, Bonaparte did not long hesitate to do. The rewards of the poet were, first, a professorship at Pavia, and, a few years subsequently, a number of offices and honours at Milan. In 1805, when Napoleon was crowned king of Italy, the event was celebrated by Monti in a poem called Il Benificio. Indeed, every fresh victory and new conquest of the Emperor of France afforded a theme for the courtly muse of the Italian poet. The triumph of Jena resounded in his ode entitled the Spada di Federico; the attempted usurpation of the Spanish throne was sung in the Palingenesi; and various other conquests were celebrated in numerous odes and hymns. Besides these works, he finished, in less than two years, a translation of the Iliad, which, without possessing much spirit, is considered as elegant and faithful.

The overthrow of Napoleon in 1814 deprived Monti of all his public employments; and after this period, although he composed an occasional poem, his labours were chiefly confined to prose. The principal of these are, considerations on the difficulty of properly translating the poetry of the Iliad, and several dialogues on the Italian language, full of wit and acute criticism. By an order of government to reform the national dictionary, his attention was still more entirely engrossed with the subject of language. The great question in Italy was, and still is, whether the pure and classical language, the only one not wholly barbarous and vulgar, is Italian or Tuscan. The academy Della Crusca espoused the latter view of the question, whilst Monti undertook a crusade against them, attacking their decisions with the utmost vigour, and no common success. He continued to reside at Milan, corresponding with various members of his family, and with the distinguished men of the day. In 1823 his imagination awoke again, and he once more turned his thoughts to poetry. He restored the true reading of the Convito of Dante, wrote an idyl on the nuptials of Cadmus, and then contemplated the completion of the Feroniade, a poem which he had begun many years before. In this production he celebrates the praise of the house of Braschi, for having, by a magnificent work, drained the insalubrious Pontine Marches. He had nearly completed his design, when death put a final period to his labours. In 1826 an apoplectic attack gave a severe shock to his frame; but he lingered more than two years, and expired on the 13th of October 1828, in the seventy-fourth year of his age.

It has been said of Dryden, that if all the great chiefs of poetry surpassed him, each in his own peculiar vein, yet his native fire and originality gave him a place close beside them. It is much the same with Monti. He has neither the sublimity of Dante, nor the tenderness of Petrarch, nor the inventive flow of Ariosto, nor the epic conception and voluptuous grace of Tasso; but he has a fervour of feeling, a power of imagery, and an overflowing redundance of ideal thought, which mark the genuine poet, and entitle him to a place immediately after these great masters of the lyre. His genius was not that of a tragedian; lyrical and imaginative rhapsodies, rather than the concatenation of a plot and the representation of human passion, were adapted to the natural bent of his mind, and in these he chiefly excelled. It is more difficult to justify his character and conduct as a man than to vindicate his claims to the laurel. In times of less public excitement, he would have quietly cultivated letters and poetry in retirement, and his faults would never have been dragged into notice. But, to atone for his political tergiversation and servile worship of power, he possessed the domestic virtues in the highest degree. He had great warmth of heart, was zealously attached to his friends, and grateful for benefits; generous, kind, and true in all the ordinary intercourse of life. A friend thus speaks of him: "In person he was tall and handsome; his forehead ample; the shape of his face regular; and his eyes, gleaming from beneath his arched and full brows, shone at once with lively yet softened light, which commanded both affection and respect. An air of melancholy was diffused over his countenance, to which the habits of reflection would have given a severe and even disdainful expression, had not the sweetest smile illuminated it with the gracious light of love. His carriage was dignified, his mien serious, and his whole aspect that of a man of talent, and of one warmed and softened by the benevolence and affection of his disposition." (R. R. R.)

Montillia || Montmorency.

MONTILLIA, a city of Spain, in the kingdom of Cordova, in Andalusia. It is situated near the river Xenil, and produces a white wine of great excellence, and which is most highly prized by the connoisseurs in the southern cities. The city stands on the Castro and Biofrio, and contains 6300 inhabitants.

MONTJOIE, a town, the capital of the circle of the same name, in the Prussian government of Aix-la-Chapelle. It is situated in a narrow valley between lofty hills, and contains 380 houses, with 3280 inhabitants. The finest cloths and cassimeres are made here, and the best machinery for the purpose is extensively applied.

MONTLUCON, an arrondissement of the department of the Allier, in France, 776 square miles in extent. It is divided into five cantons and 95 communes, and contains 79,050 inhabitants. The capital is the city of the same name, situated on the right bank of the river Cher. It is surrounded with walls, and defended by a castle upon an elevation which commands the town. In 1836 the inhabitants amounted to 5034, who were chiefly employed in woollen manufactures. Long. 2. 31. E. Lat. 46. 22. N.

MONTMEDY, an arrondissement of the department of the Meuse, in France, extending over 478 square miles. It is divided into six cantons, and these again into 131 communes, containing 68,495 inhabitants. The capital is a city of the same name, situated on the river Ehiers. It is strongly fortified, and defended by a citadel in the upper town, built on a rocky eminence. In 1836 it contained 2251 inhabitants. Long. 5. 20. E. Lat. 49. 36. N.

MONTMORENCY, a town of the department of the Seine, and Oise, and arrondissement of Ponloise, in France. It is finely situated, and near it is the valley of the same name, which was long the residence of the celebrated Rousseau. In 1836 it contained 1789 inhabitants.

Montmorillon || Montreal.

MONTMORILLON, an arrondissement of the department of the Vienne, in France, extending over 612 square miles. It contains six cantons, divided into 60 communes, inhabited by 57,151 persons. The capital is the city of the same name, situated on the river Gartempe, by which it is divided into two parts. In 1836 it contained 460 houses, and 4157 inhabitants.

MONTPELLIER, an arrondissement of the department of the Hérault, in France, 779 square miles in extent. It comprehends 14 cantons, which are divided into 116 communes, and contains 123,656 inhabitants. The capital, which gives its name to the arrondissement, is in a fine district, is surrounded with walls, and stands on the declivity of a hill between the river Mardanson and the Lez. The higher part of the city consists of narrow and crooked streets, with very few good buildings; but the lower part or suburb has good, well-built, regular streets. The city has some beautiful promenades around it; and from an elevated public walk near it, called the Place du Peyron, there is one of the finest prospects in Europe. The city contains a university of great celebrity, with a library of 42,000 volumes, a museum, and an observatory. In 1836 it contained 35,506 inhabitants, of whom about 6000 are Protestants, who, besides cloths of cotton and wool, produce many chemical preparations, particularly cream of tartar, vitriol, aquafortis, ether, glauber salts, sugar of lead, spirit of salt, and much perfumery. The trade is facilitated by a canal, which connects the city with the Mediterranean. Long. 3. 47. E. Lat. 43. 36. N.

MONTREAL, a city of Lower Canada, the first in size and commercial importance, and the second in rank, in that district. The island and signiory, on the south side of which the city stands, is about thirty miles in length by from five to ten in breadth, and contains 197 square miles. It is situated on the St Lawrence, at the head of ship navigation, 180 miles above Quebec, and 200 below Lake Ontario. On the north a small stream divides it from the Isle of Jesus, which is also a signiory, and about twenty miles long; and from Isle Bizare, which is four miles in length. Montreal is situated close to the river, upon a belt of land about two miles in breadth, and at the back of which is the Royal Mountain. The bank of the river upon which it is built has a gradual elevation of from twenty to thirty feet, sloping again at the back of the town, where there is a canal to carry off any accumulated water. Including the suburbs, it is much more extensive and somewhat more populous than Quebec, but it wants the sublime scenery which characterizes that city. The whole of the lower town has a gloomy and uncomfortable appearance, the streets being narrow and incommodious. It consists of one principal street for shops and trade, which runs parallel to the river, with others which cross it at right angles, and also intersect another street running parallel to it, and dividing the old from the more modern town. This part of Montreal contains several spacious public buildings, with a number of fashionable dwelling-houses, built of stone; and the villas in the neighbourhood have an imposing appearance. It has a respectable esplanade called the Champ de Mars, where the troops are reviewed. To the east extends the Quebec suburb, and to the north and west the suburbs of St Antoine, St Lawrence, and St Recollet. Amongst the public buildings, the first which requires to be mentioned is the new Catholic cathedral, said to be the most splendid temple in America, not excepting that of Mexico, which, however, is nearly equal to it. The foundation-stone was laid in 1824, and it was opened for public worship in 1829. This magnificent structure is thus described by Mr M'Gregor in his work on British America. "It is dedicated to the Virgin Mary. Its length is 255 feet, breadth 234, and the height of the walls 112 feet. The style of architecture is taken from the rich Gothic of the thirteenth and fourteenth centuries. It has six massive high towers; between these, along the roof, is a promenade twenty-five feet wide, elevated 112 feet above the ground. It has one superior altar, and six of less grandeur. It has five public and three private entrances; and from 10,000 to 12,000 people, which it will accommodate, may disperse in five or six minutes. The eastern window, behind the altar, is thirty-three feet broad and seventy high; the other windows are ten feet by thirty-six feet. It is surrounded by a fine terrace. The chime of bells, clocks, altars, and all the interior arrangements, correspond with the magnificence of the exterior. From 7000 to 8000 persons frequently congregate within this edifice." There are several other Catholic churches besides the cathedral; one of these, large, but plain in appearance, was built in the suburbs, upon the arrival of a bishop from France, after the termination of the late war, and for whom a palace was built near it. The bells of the Catholic churches are kept constantly ringing, which is a great annoyance, especially to strangers. The whole island of Montreal is comprised in one signiory, and is claimed by the seminary of St Sulpice, which consists of twenty members and four assistants. They discharge the whole parochial duties for the Roman Catholic population of the town and suburbs; and they maintain, in whole or in part, a college, at which 204 young men are educated in the classics and sciences. They also educate, at various schools which they have established, more than 1300 scholars, besides making extensive distributions in charity. In addition to these various duties, the whole management of the farms, and other temporal concerns, is carried on by the members. The revenues of the seminary may be taken at an average of L.8277 currency a year, equal to L.6700 sterling. In exacting the *lods et ventes* due to them on the transference of land, they are very liberal, and usually compound for these fines. The improvement of Montreal has been much retarded by signorial and feudal exactions. The feelings of the Protestants have been much mortified in being compelled to submit to demands for the support of institutions contrary to their principles; whilst no attention was paid by the British government to the establishment of scholastic institutions for the benefit of the Protestant community. The adjustment, therefore, of the claims of the seminary of St Sulpice is the most important subject in which the inhabitants are interested. The principal English church is a handsome and spacious edifice. The Scotch kirk is a plain unadorned building, but the Methodists have a very fine chapel. The court-house, prison, and government-house, are substantial buildings, but without any pretensions to architectural beauty. There are three nunneries in the city, belonging to which are some beautiful islets, as well as lands on the largest of these islands. There exists at present no means of college education for Protestants. There is a natural history society, which has been of great use in illustrating the natural history and unfolding the vast resources of America. There are also a mechanics institution, a general hospital, and a well-conducted news-room; and twelve newspapers, as well as some other periodicals, are published in Montreal. It enjoys considerable trade, and possesses several manufactures. There is a cast-iron foundery; and machinery for steam-engines, stoves, and the like, is made in the town. There are likewise distilleries, breweries, and other manufactures of necessary articles; and also several ship-building establishments. A bank was established in 1817, and there is now a branch of it at Quebec. There is likewise a committee of trade, which regulates various commercial matters and charges. There are no wharfs at Montreal, and the ships and steamers lie quietly in pretty deep water, close to the clayey and generally filthy bank in front of the city. From its position, Montreal will always

Montreal.

Montreuil ‖ Montrose.

constitute one of the greatest commercial emporiums of America; and it must increase in magnitude and importance, along with the rapid improvement and increasing population of the upper and surrounding countries. The trade is not suspended in winter, as at Quebec. During that season, thousands of sledges come in from all directions laden with agricultural produce, frozen carcasses of beef and pork, firewood, and other articles. In return these traffickers receive manufactured goods of all kinds, the warehouses and markets being always well supplied. In summer vast rafts of timber pass Montreal for Quebec; and boats of a rude construction bring down the productions of the upper country. This was the headquarters of the fur trade before the North-west and Hudson Companies joined their interests; and there is still a warehouse there. More than three fourths of the population are French; the rest are Britons and Americans. The population in 1825 amounted to 22,357, and in 1831 to 27,297; at present (1837) it is nearly 37,000. The city of Montreal is represented in the provincial legislature by four members; the county by two. The imports and exports, as well as other statistical information, are included in those of Quebec, and will be found under that article. Montreal is situated in long. 73. 25. W. and lat. 45. 30. N. (R. R. R.)

MONTREUIL, an arrondissement of the department of the Pas de Calais, in France. It extends over 419 square miles, and is divided into six cantons, which are subdivided into 141 communes, having a population of 78,658 persons. The capital is of the same name, and stands on the left bank of the river Canche, eight miles from the sea. In the year 1836 it contained 3867 inhabitants, who subsist in part from trading in leather and linen, and refining sugar, and tanneries, and in part from the custom of travellers passing through it on the way between Calais and Paris.

MONTREUIL, a town of France, six miles east of Paris. It is known for the extensive gardens and nurseries attached to it. The population is above 3500.

MONTREUX, a large and neat village between Veray and Chillon, in the canton of Vaud, Switzerland, beautifully situated on an eminence overlooking the lake of Geneva. Long. 6. 54. E. Lat. 46. 26. N.

MONTROSE, MARQUIS OF. See GRAHAM.

MONTROSE, a royal burgh and sea-port town of Scotland, in the county of Forfar, distant seventy miles north-east from Edinburgh, thirty north-east from Dundee, and about forty south from Aberdeen, in longitude 2. 10. west, and latitude 56. 34. north. It is pleasantly situated on the west side of a narrow sandy peninsula, formed by the German Ocean on the east, the South Esk river on the south, and on the west by a large basin, into which the tide, flowing up the South Esk, spreads itself after passing the town. It is a burgh of high antiquity, and received its first charter from David I., although, from the tenor of that charter, it seems to have been a burgh even before that time. The petty-customs, weigh-house and flesh-market dues, &c. are levied in virtue of a charter granted by David II. James IV. also granted a charter, dated 1493, by which the magistrates are still empowered to levy shore-dues, anchorage, and plankage, at the harbour, for the purpose of upholding piers, buoys, and moorings. The magistrates likewise hold a writ of privy seal from James VI. dated 1600, authorizing them to hold a weekly grain-market on the High Street. Owing to an informality in the election of its magistracy in 1816, the burgh was disfranchised by the Court of Session; and in 1817 a new charter was granted by the crown, by which the old practice of self-election was abolished, and every year ten of the council were renewed by the suffrages of the guildry and trades. But the municipal reform act improved on this charter, and now the magistrates and councillors are elected by the parliamentary voters. The town-council consists of nineteen members, including the provost, three bailies, dean of guild, treasurer, and master of the hospital. Their jurisdiction extends over the royalty of the burgh. The Constable Hill, which the town acquired by purchase, is beyond their jurisdiction, although included in the parliamentary boundaries. Montrose.

The name of the town is connected with some important events in Scottish history. It was here that in 1296 John Baliol surrendered his crown to Edward I. of England; and it was from the port of Montrose that the celebrated Sir James Douglas embarked in 1330, with a numerous retinue, on a pilgrimage to the Holy Land, to bury the heart of King Robert Bruce in the Holy Sepulchre. It is distinguished as the first place in Scotland where the Greek language was taught, and as having sent forth from its seminary the learned scholar and divine, Andrew Melville. It is likewise the birth-place of the celebrated Marquis of Montrose. This was the only town in Scotland, so late as the commencement of the eighteenth century, where an individual could be found who understood the management of pumps in coal-works. In December 1715, James, the first pretender, landed here from the French fleet, which had passed the Frith of Forth, the place of its destination; and here also, in February of the ensuing year, he and his suite again embarked for France.

The town is in general well built, and has of late years been considerably enlarged by the erection of several new streets. The principal street extends, under various denominations, the whole length of the town; and the centre part of it, named the High Street, is spacious, and contains many elegant buildings. From the east side of this main street run several cross streets, which connect it with the different smaller streets and buildings lying in that direction. The town-house, which stands in the High Street, is a handsome edifice of two stories, with an arcade below, and contains the council-room, guild-hall, court-room, news-room, and public library. The old parish church, which is collegiate, is a large, plain building, measuring 98 feet in length by 65 in breadth. It has two tiers of galleries, and is seated for 2500, but contains nearly 3000. A new steeple was attached to it in 1835, consisting of an elegant and massive Gothic tower, upwards of a hundred feet high, surmounted by a spire nearly of the same height. This is said to be the highest steeple in Scotland. St John's Church, formerly a chapel of ease to the old parish church, but to which a parish was annexed in 1835, is a handsome edifice, seated for about 1500 individuals. There are also two congregations belonging to the United Associate Synod, two of Episcopalians, one of Independents, one of Methodists, two of Baptists, and one of Glassites. St Peter's Chapel, belonging to the Episcopalians not connected with the Scottish communion, was founded in 1722, and is a neat and commodious place of worship. The Academy, erected in the year 1814, is a fine edifice. It is under the patronage of the town-council, and is conducted by a rector, who teaches mathematics, geography, and modern languages; and it has, besides, two teachers of English, two for writing and arithmetic, and two for Latin and Greek. In 1832 a spacious seminary was erected by the seven incorporated trades, for affording education on cheaper terms than those of the Academy. There is a free school, founded by Mr David White, in which a hundred boys are taught; and another supported by Miss Straiton's endowment, in which forty-two boys and thirty-five girls are educated. Besides these, there are numerous private schools throughout the town. The Lunatic Asylum, situated in the Links, is a plain and commodious edifice. It was erected in 1780, but has since then been considerably enlarged, and is now capable of containing eighty patients. It is considered as being one of the best institutions of the kind in Scotland. A portion of the

Montrose.

building has hitherto been used as an infirmary and dispensary; but the managers are now (1837) preparing to erect a separate building for these purposes. In 1833 a commodious new jail was erected.

There are in the town two libraries, one of which was established in 1785, on a liberal plan, and now contains about 7000 volumes. The other, called the Montrose Reading Society, possesses about 2200 volumes, and is supported chiefly by the working classes. The two parish churches have likewise libraries attached to them. A newspaper was established in 1811, named the Montrose, Arbroath, and Brechin Review, which is published every Friday morning; and another, in 1837, called the Montrose Standard, every Thursday. There are here numerous associations for the encouragement of commerce, literature, and science, as well as for benevolent and charitable purposes.

It has already been stated that the town is bounded on the west by the Basin. This is an extensive level, over which the waters of the ocean, flowing up the South Esk, spread at flood, but which again becomes dry with the ebbing of the tide. During high water it presents the appearance of a vast lake, being about seven miles in circumference, and not only adds greatly to the beauty of the scenery, but is highly advantageous in a commercial point of view, as it affords sufficient depth of water in the channel of the river for allowing small vessels to be navigated to the distance of three miles above the harbour; whilst the vast quantity of water by which it is filled, running back to the ocean with a strong current at the ebbing of the tide, prevents the increase of the bar at the mouth of the river, and thereby renders the harbour at all times accessible to large vessels. The harbour is commodious, and the entrance to it is easy, except during easterly winds, the average depth on the bar at low water of spring tides being eighteen feet. Two light-houses, with fixed lights, were erected on the north side of the river in 1818, by which vessels are now enabled to take the harbour with safety in the darkest nights. The lights are seen in clear weather at the distance of eight miles. Accommodation for shipping, to the extent of about 6000 tons, is about to be provided, by means of a wet dock on the north side of the river, which will greatly promote the commercial prosperity of the port.

The great northern turnpike crosses the South Esk by means of two bridges; one of stone, with a revolving drawbridge in the centre, to allow vessels to pass up and down the Basin, on the south side of the small island of Inchbrayock; the other a magnificent suspension bridge, from Inchbrayock to the north side of the river. The foundation-stone of this bridge was laid on the 18th of September 1828. It was designed by Captain Brown, the patentee, and finished at a cost of about L.20,000. The distance between the towers at the two extremities of the bridge, measuring from the centre of each, is 432 feet. There are four main chains, supported by two stone towers, seventy-one feet in height; these form the grand entrance to the bridge on each side, through an archway sixteen feet wide by eighteen feet high. The four counter-abutments for securing the back-stay chains are 115 feet distant from the tower, reckoning from the centre of the tower to the face of the farthest wall of the chambers, and consist each of an arched chamber, a strong counterfort or abutment, a tunnel, and lying spandrel arch. From these main chains the platform is suspended; this forms a roadway twenty-six feet in breadth, constructed upon iron beams, to which the planking or platform is bolted. It is about to be strengthened by an additional back-stay chain. To prevent the hollow sound arising from the tread of horses on the wooden platform or roadway, a composition of coal, tar, pitch, and broken metal, is laid over the planking, which, besides preserving it, is impervious to water. There is a pontage levied at the bridge, which yields about L.1300 a year.

Montrose is a town possessed of considerable commerce. It is a port of the customhouse, and, as such, includes the havens and creeks from Bervie Brow to the Tay. The gross receipts for the year ending 5th January 1835 amounted to L.7369. 2s. 9d.; for the year ending same date 1836, to L.6827. 3s. 2d. Nett receipts, after deducting all expenses, for 1835, L.2135. 9s. 6d.; for 1836, L.1672. 7s. 8d. The vessels belonging to the port amounted, in 1837, to 105, registering about 11,050 tons. A great proportion of these are engaged in the importation of flax from the different ports on the Baltic. A number are also employed in bringing coals from Newcastle and Sunderland for the use of the town and neighbourhood; and there are two large vessels engaged in the whale-fishery. A very large steam-vessel, and two regular traders, are now employed in the London trade. The exportation of cured herrings and salmon is considerable. Ship-building is carried on to a considerable extent; and there is a commodious patent slip for repairing ships. The principal business of the town consists in making sail-cloth, sheeting, and linen; and there are now several extensive flax spinning-mills connected with this trade, besides two rope and sail manufactories.

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There are here very extensive links or downs between the town and the sea, which afford one of the best golfing grounds in Scotland, a game practised by all ranks. The race-ground on the links is admirably fitted for the purpose, but for several years it has not been used.

The inhabitants of Montrose have availed themselves of the general police act for burghs, passed a few years ago; and the town is now properly protected by an efficient body of police. Very great improvements have also been made in the paving and cleaning of the streets. The town is well lighted with gas, and abundantly supplied with water conducted by pipes from a distance of three miles.

Montrose unites with Forfar, Brechin, Arbroath, and Bervie, in sending a member to parliament. The number of voters in the parliamentary burgh is about 400. In September 1836, the burgh funds were estimated at L.54,344. 2s. 7d. and the debts and obligations at L.29,609. 11s., leaving a balance in favour of the town of L.24,734. 11s. 7d. The revenue of the town, arising from land, feu-duties, and shore-dues, is nearly L.3000 a year.

The population of the town in 1811 amounted to 8955; in 1821, to 10,338; and in 1831, to 12,055. The number of inhabited houses in the latter year was 1190. The population is now (1837) estimated at 15,000.

MONTSERRAT, a celebrated monastery of the Benedictines, in Spain. It is about nine leagues to the north-west of Barcelona, being situated on the right bank of the river Llobregat, on an insulated mountain nearly eight leagues in circumference, and raising its head above the surrounding hills till it reaches the height of 3300 feet. It appears, from the road to it, like a huge pile of most enormous bowls, the bitumen which joined the stones having been decomposed. As the traveller ascends, he observes vegetation gradually decreasing, till towards the top, when it entirely ceases, and nothing is presented to the view but naked rocks, separated like pillars, forming various pyramids, varying in height from 20 to 150 feet. The ascent, though steep and fatiguing, is not dangerous, as far as the church, which is large and richly ornamented; but the constant smoke of upwards of eighty lamps lighted with oil has sullied the statues and pictures, and dimmed the brilliancy of the silver. The number of monks and lay-brothers residing here amounts to upwards of one hundred; besides which, there are twenty-five boys who officiate in the choir, with a physician, surgeon, and servants. Besides those who reside in the convent, there are several of the monks who live in a kind of hermitage or oratory on the pinnacle of several of the insulated rocks. These hermits are supplied with food twice in the week, and their gardens yield some

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fruits. They are not permitted to eat meat, or to converse with each other, but live a life of perfect solitude, possibly of devotion, during the whole day, excepting when they descend to the general service, which is performed in the church of the convent. The term of the noviciate for the ordinary monks is six months; but those who wish to live in one of the hermitages must pass six years of very severe probation before they can be allowed to reside in them. Although the romantic situation, the extensive and varied prospects, and the natural curiosities of the place, draw to it many travellers who are not infected with any devotional feeling, yet the number of real votaries is very great. These come to say prayers, to pass a few days in devotion and contemplation, to kiss with reverence the hand of a miraculous image of the holy Virgin; and, what is of most importance to the institution, to deposit votive offerings, which are eagerly accepted by the recluse inhabitants. By the rules of the order, they are bound to maintain for three days every pilgrim who comes to pay his devotions to the sacred image. The devotees are allowed bread in the morning, broth at noon, and bread again at night. Although this parsimonious kind of hospitality is not very expensive for each individual who arrives, yet the number is so great that the annual cost is considerable; and although the presents from the rich far exceed the cost of their maintenance, yet these presents are preserved carefully till they are quite spoiled by age. Their original endowment was only the mountain; but by rigid economy they have, in the course of ages, been enabled to purchase considerable estates in the vicinity. Some of these, indeed, have been appropriated by the government to its own use, and probably at no distant period the remainder may share the same fate.

It is singular that there should be always a number of candidates, both for the cells of the monks and for the hermitages of the recluses. They make a vow never to quit the mountain, and they are not allowed to enter into holy orders. This may perhaps account for the continuance of those who are once admitted; but it is not easy for Protestants to understand that state of mind which induces men in the full vigour of their bodily and mental faculties to withdraw from the world, and abandon every pursuit but that of inactive devotion and the tiresome repetition of prayers, with no variety to amuse and no excitement to animate them.

MONTSERRAT, one of the West Indian islands, belonging to Great Britain, is situated in 16. 47. north latitude, and 92. 13. 25. west longitude. It is about twelve miles in length by seven and a half in breadth, and contains a superficies of 30,000 acres. Like the islands in its vicinity, it runs from south-east to north-west, and presents an equally broken and mountainous surface; an arrangement and physical structure which has led to the conclusion that these islands owe their origin to volcanic eruption. The extremity of the mountain chain terminates on the north in a bold headland coast, where there is no landing-place and little anchorage. The land slopes to the sea in a succession of conglomerate eminences, which extend to the base of the mountain. On the south there is no approach for vessels of any size until they get to the westward, the sea for a mile or two being studded with huge rocks and shelving banks of coral. The island then suddenly shoots up to the height of 1500 feet, and continues to rise pile above pile, throwing out lateral branches, until they attain the altitude of 2500 feet above the level of the Atlantic. This chain stretches across to the northern extremity of Montserrat, where it terminates, as we have mentioned. Many of the mountains are inaccessible, and are separated from each other by immense perpendicular chasms several hundred feet in depth. These gullies, however, as well as the mountains, are covered to the very summits with lofty woods, and all the beautiful variety of vegetation which a mountainous region within the tropics presents. On the south-west side of the chain is a small *souffrière*, situated 1000 feet above the sea, in a dell formed by the approximation of three conical hills, the scenery around which has been described by Mr Coleridge as grand and beautiful in the highest degree. The road from Plymouth, the capital of Montserrat, to this place, after stretching along the margin of the sea, winds inwards by a gentle declivity towards the mountains. The path becomes strewed with the snowy amaryllis (*pancratia Caribbæa*), and the scarlet hibiscus; and on either side lime and orange trees form a verdant hedge. The whole of the valley in which the souffrière lies is broken into vast and irregular masses of clay and limestone, which are scattered about in the utmost confusion. The surface of the ground is everywhere hot, indeed so much so near the streams of water which run between the fragments, that it is difficult for the foot to support it more than half a minute. The water at its source boils up violently, and a cloud of vapour constantly settles over it. The sides of the mounds of clay are encrusted with pure alum; but, notwithstanding this, the vegetation of bushes and creepers all round is green and luxuriant, whilst the rampart of mountains in which the solitary valley is embosomed is clothed with woods whose feathery grass-like plumage bends devotedly to the setting sun under the unceasing breath of the trade-wind. There are no marshes, but there is a small lake on the top of a hill about two miles west from Plymouth, which remains constantly full. Plymouth, the capital, is small, but substantially built, of a fine gray stone, and has a comfortable appearance. The geological features of this island are similar to those of the islands in the neighbourhood. Many of the rocks have been termed only vast masses of clay of divers hues; but in the conical hills carbonate of lime, iron pyrites, and aluminous earth abound. The soil is in general dry, light, thin, gravelly, and thickly covered with blocks of clay and sandstone, excepting in the valleys where the loamy earth is deposited by rains. The climate of Montserrat is remarkable for its salubrity, a characteristic which has obtained for it the name of the Montpellier of the West Indies. The temperature of course varies according to the locality and the elevation above the sea. It is subject to hurricanes, but these are neither frequent nor severe. To enumerate the staple products of Montserrat, would be merely to recapitulate what is said of them under the heads of JAMAICA, ST LUCIA, and other West India islands. Indigo was formerly raised in great quantities, but this branch of agriculture is now abandoned. The sugar and rum produced are highly esteemed. Of the former there were exported in 1832, 2,322,208 pounds, valued at L.16,549; and of the latter, 74,064 gallons, valued at L.3307. The total amount of exports for the same year was L.21,517, and of imports L.11,067. In 1830 the shipping inwards was 5824 tons, and outwards 6576 tons. By the latest return it appears that, between the 5th of January 1836 and the 5th of January 1837, there were imported into the united kingdom from this island 12,152 cwts. of sugar, 16,256 gallons of rum, and 2694 cwts. of molasses.

The executive of this island is embodied in the government of Antigua, but the inhabitants enjoy their separate council and house of assembly, the former consisting of six members and the latter of eight, two being sent from each of the four districts into which Montserrat is divided. The gross annual revenue is about L.2500. There are five places of public worship, capable of containing 1000 persons, and also a Wesleyan missionary station; and there are six public or free schools, with 298 male and 390 female scholars. Montserrat was at one time more densely peopled with Europeans than it is at present. The popu-

Monza || Mooltan.

lation, including all classes, is now estimated at about 7400 This island was discovered by the companions of Columbus, and called by them Montserrat, a name expressive, in the Spanish language, of its broken and mountainous appearance. It was first settled in 1632, by Sir Thomas Warner, under the protection of the British government. It was taken by the French about the year 1664, but restored to Britain at the peace of Breda, and it has ever since formed a part of our empire.

MONZA, a city of Italy, in the delegation of the Austrian province of Milan. It stands on the river Lambro. There is here a magnificent imperial palace and park, with a menagerie; and it contains six churches, one of them an abbey. The celebrated iron crown of the ancient kings of Lombardy was formerly preserved here. Monza contains 5750 inhabitants, who find employment chiefly in making silk; but partly also from tanneries and hat making. Long. 9. 11. 51. E. Lat. 45. 34. 31. N.

MOOGDUL, a town of Hindustan, in the province of Bejapoor, and capital of a district of the same name. Long. 76. 47. E. Lat. 16. 6. N.

MOOLTAN, or MOULTAN, a province of Hindustan, which formerly comprehended the country on both sides of the Indus, between the 24th and 30th degrees of north latitude. It is bounded on the north by Lahore and Afghanistan, on the south by Ajmeer and Sinde, on the east by Lahore and Ajmeer, and on the west by Beloochistan. The following are the territorial subdivisions of this province, namely, first, Mooltan Proper; second, Bahawulpoor; third, Backar; fourth, Sinde; fifth, Tatta; sixth, Chalchkaun. The greatest length of this territory is 110 miles, by about 70, its greatest breadth; and it is comprehended between the Sutleje, or the Gurrah, as it is here named, the Ravey, and the Chinaub. The northern and eastern districts of this province are watered by the rivers of the Punjab, and the tract which is within the reach of the inundation is extremely fertile, but becomes gradually more sandy and barren as it approaches the desert situated between Sewee and Backar, over which, during the summer months, the hot winds usually blow. To the west of the Indus the country is still more arid and barren, and terminates in a long ridge of black rocks. Fine camels are produced in many parts of this province; and a breed of excellent horses, said to be descended from those of Nadir Shah, stolen by the natives from him whilst on his return to Persia. It is related, in the Mahommedan annals, that this province was invaded about the year 712, by a body of Arabs under the command of Mohammed Cossim, who converted many of the natives to the Mahommedan religion. It was invaded early in the eleventh century by the celebrated Mahmoud of Ghizni, and was afterwards subject to the monarchs of Delhi. After the overthrow of this empire by Timour, in the end of the fourteenth century, it remained an independent kingdom till the middle of the sixteenth century, and soon afterwards became subject to the Mogul dynasty, on the decline of which it fell into the hands of independent chiefs. It was in the hands of the Mahrattas a short time before the battle of Paniput, after which it was lost by them, and never subsequently recovered. At a later period it was occupied by the Sikhs. The greater part of it was long held by the nabob of Mooltan, who was obliged to pay tribute to the Afghans, Sikhs, and rulers of Sinde, by whom he is surrounded. In 1818 it was taken possession of by Runjeet Singh, under whose rule it still remains. Little is known of the internal government, but it is known to be oppressive and tyrannical, being subject, besides the extortions of the government, to those of a licentious soldiery. The population consists of Afghans, Jats, and other Hindu tribes; but the cities are occupied by people from all parts of the East. Its principal towns are Behawulpore, Adjodin, Cutch, Mooltan, and Debalpore.

MOOLTAN, the capital of the above province, situated four miles from the left bank of the Chinaub or Acesines, below the points where it receives the waters of the Ravey (Hydraotes) and the Jhylum (Hydrastes), and about thirty miles above its confluence with the Indus. It is enclosed by a fine wall from forty to fifty feet in height, with towers at regular distances; and has a citadel on a rising ground, with several fine tombs, two of which have very high cupolas, and are ornamented with painted and glazed tiles, which give them a magnificent appearance. There are other places of interment scattered round the town; and Elphinstone, who visited this place in his journey to Peshawer, in Afghanistan, mentions that the country immediately around the city is fertile, well cultivated, well watered from wells, and productive of wheat, millet, cotton, turnips, carrots, and indigo. Mooltan is noted for the manufacture of silks, and for a species of carpet, which, however, is much inferior to those of Persian manufacture. This is supposed to have been the city known anciently by the name of Malli; and in 1582 it is described by Abul Fazel as one of the most ancient cities of Hindustan. It was plundered by Mahmoud of Ghizni about the year 1006, and was again plundered by Timour in 1398. For many years the nabob paid a tribute annually, for protection, to the sovereign of Cabul. In 1806 it was captured and plundered by Runjeet Singh. In 1809 the nabob was obliged to pay tribute to the Ameers of Sinde; and in 1818 it was again captured by Runjeet Singh, who still retains possession of it. Long. 71. 7. E. Lat. 30. 9. N.

Moon.

MOON (*Luna*, ☽), in *Astronomy*, one of the heavenly bodies, usually ranked amongst the planets; but with more propriety accounted a satellite, or secondary planet. See ASTRONOMY.

Amongst the ancients, the moon was an object of particular homage. By the Hebrews she was more regarded than the sun, and they were inclined to worship her as a deity. The new moons, or first days of every month, were kept as festivals amongst them, and were celebrated with the sound of trumpets, with entertainments and sacrifices. (See Numb. xviii. 11, x. 16; 1 Sam. xx. 5–18). People were not obliged to rest on these days. The feasts of new moons were a miniature representation of the feast of trumpets, held on the first of the month of Tisri, which was the beginning of the civil year. The Jews not being acquainted with the physical causes of eclipses, looked upon them as signs of the divine displeasure. The Grecians looked upon the moon as favourable to marriage; and the full moons, or the times of conjunction of sun and moon, were held the most lucky seasons for celebrating marriages, because they imagined that the moon had great influence over generation. The full moon was held favourable for many undertakings by the Spartans; and no motive could induce them to enter upon an expedition, march an army, or attack an enemy, until the moon was full. The moon was supposed, both by Greeks and Romans, to preside over child-birth. The patricians at Rome wore a crescent on their shoes, to distinguish them from the other orders of men. This crescent was called *lunula*. Some say it was of ivory, others that it was worked upon the shoe, and others that it was only a particular kind of *fibula* or buckle.

Harvest-Moon. It is remarkable that the moon, during the week in which she is full in harvest, rises sooner after sunset than she does in any other full moon week in the year; and by doing so, she affords an immediate supply of light after sunset, which is very beneficial to the farmers for reaping and gathering in the fruits of the earth. Hence they distinguish this full moon from all the others in the year, by calling it the *harvest-moon*.

Influence of the Moon on the Human Body. Dr Mead was a believer in the influence of the sun and the moon on

Moon. the human body, and published a book entitled *De Imperio Solis ac Lunæ in Corpore humano;* but this opinion has been exploded by most philosophers, as equally unreasonable in itself, and contrary to fact. As the most accurate and sensible barometer is not affected by the various positions of the moon, it is not thought likely that the human body should be influenced by them. Several learned and ingenious men, however, still consider Dr Mead's doctrine as far from being unfounded.

Moon, *influence of, on the earth's atmosphere.* It has been the opinion of the vulgar in almost all ages and countries, that the changes which take place in the state of our atmosphere, or the changes of the weather, depend, in a great measure, on certain situations of the moon. It can scarcely be doubted that an opinion so generally received must be founded on something more than fancy or prejudice; and indeed the observations of meteorologists have contributed materially to favour this opinion.

From the observations of Signior Toaldo, made at Padua, during fifty years, on the state of the weather, which corresponded to certain changes of the moon, he found that these changes were always accompanied by good or bad weather; and he at length became enabled to foretell, with some degree of certainty, what would be the state of the atmosphere which should follow any situation of the moon. There are ten situations of the moon, which, according to Toaldo, are capable of producing a sensible effect upon the earth's atmosphere. These are the *syzigies*, or new and full moon; the quadratures; the *apsides*, or apogee and perigee; the *lunistices*, or those points when the moon is nearest to our zenith and at the greatest distance from it; and the moon's *equinoxes*.

He also calculated a series of probabilities that a change of weather will take place on the approach of any one of ten situations, and these he expressed in a tabular form, as follows:

That a change will take place at	New moon	is	6 : 1
	First quarter		5 : 2
	Full moon		5 : 2
	Last quarter		5 : 4
	Perigeum		7 : 1
	Apogeum		4 : 1
	Ascending equinox		13 : 4
	Northern lunistice		11 : 4
	Descending equinox		11 : 4
	Southern lunistice		3 : 1

The observations of M. Lamarck, though they confirm the opinion of the moon's general influence on the atmosphere, do not agree with those of Toaldo, as to the situations of that luminary which correspond to the changes of the weather. He could not find that agreement between the syzigies and quadratures of the moon and a change of weather which has been so much dwelt on by Toaldo; but he is of opinion, that we are to consider the declination of the moon as the principal cause of her influence on the atmosphere.

Lalande had conceived the idea that when the moon entered the northern hemisphere, or had north declination, the weather was most likely to be cold and dry, and that when she passed to the south of the equator, it was likely to be rainy. The observations of Lamarck, however, tend to establish the contrary opinion.

Lamarck considers the two following principles as established by his observations, viz. "1. That it is in the elevation of the moon above, and her depression below, the equator, that we are to search for those regularly varied effects which she produces on our atmosphere. 2. That the determinable circumstances which conspire to increase or diminish the moon's influence in her different declinations, are her apogees and perigees, her conjunctions with and oppositions to the sun; and, lastly, the solar solstices and equinoxes."

Considering that every lunar month, or every revolution of the moon in the zodiac, may be divided into two distinct portions, each containing about fourteen days, and each giving occasion to a particular atmospheric constitution, we may assume these as two circumstances of importance in meteorology, and call the one the *boreal* or northern constitution, being that in which the moon passes through the six northern signs of the zodiac, and the other the *austral* or southern constitution, being that in which she traverses the six southern signs.

Lamarck was convinced by observation, that in these climates, during a boreal constitution, there chiefly prevailed southerly, south-westerly, and westerly winds, though sometimes, in the summer, the winds passed to the south-east. In general, during this constitution, the barometer exhibits only moderate elevations of the mercury; most commonly the season is rainy or moist, and the air is loaded with clouds. And, lastly, it is particularly during this constitution that we observe the effects of storms and tempests, when the causes which occasion them become active. On the contrary, during an austral constitution, the winds which chiefly predominate blow from the north and north-west, and in the summer north-east, and even easterly winds prevail. In general, during this constitution, the barometer exhibits considerable elevations in the column of mercury, at least if the wind be not very strong; the weather is then most usually clear, cold, and dry, and in the summer it is seldom, we might almost say never, during this constitution that storms are formed.

These atmospherical constitutions are not, however, so permanently characterized as to render it easy to distinguish them at all times by the state of the atmosphere. The atmospherical air is a moveable fluid, and so easily displaced, that it is not surprising that in the temperate zones, where, from various causes, which counteract the regular influence of the moon, and tend to alter its effects, the influence of the heavenly bodies acts less strongly than between the tropics.

The perturbations which these variable causes produce on the regular effects of the influence of the moon on the atmosphere, occasion many variations in the two atmospherical constitutions which we have been describing; and this is doubtless the reason why they have been hitherto disregarded. Lamarck positively asserts, that these perturbations, although frequent, and sometimes very considerable, do not prevent the character of each of these constitutions from being remarked in the greatest number of cases. The probability which he finds, according to his observations, is estimated at five out of eight; that is to say, out of forty-eight atmospherical constitutions comprehended in the lunar year, he estimates that there will be found at least thirty agreeing with the principles pointed out in his memoir; and he adds, that amongst the disturbing causes which modify the before-mentioned effects, several may be foreseen, and perhaps even appreciated as to their quantity of effect. He considers what is here pointed out as a fact, that is, as an order of things which any one may prove by observation.[1]

M. Cotte also bestowed much attention on the subject of the moon's influence; but he appears to think that our observations are not sufficiently numerous nor accurate to deduce any thing like a correct theory, and he is not disposed to go as far as M. Lamarck. He agrees in general

[1] See *Journal de Physique*, vol. iii.; and Nicholson's Journal, 4to, vol. iv.

Moor. with Mr Luke Howard's observations on the moon's influence. During the space of thirty-four years and five months (from the 1st of January 1768 to the 22d of May 1802), he noted the ascending and descending direction of the barometer in each of the syzigies and quarters of the moon which occurred during that period of time. He states the total sum of the elevations and depressions of the mercury at each of the phases as follows:

For 34½ Years.	New Moon.	1st Quar.	Full Moon.	2d Quar.
Sum of elevations.....	218	296	199	290 times.
Sum of depressions....	281	229	279	106
Differences.....	63	67	80	84

For some further account of opinions on this subject, see the article WEATHER.

MOOR, JAMES, an eminent Grecian, was born at Glasgow on the 22d of June 1712, being the son of James Moor and of his wife Margaret Park. His father, a teacher of mathematics in that city, is commemorated as a lover of learning: when he did not think himself rich enough to purchase a copy of Newton's Principia, then sold at a very high price, he transcribed the entire book with his own hand. He died before his son attained the age of manhood. He also left a widow and two daughters. One of these, named Elizabeth, became the wife of Robert Foulis, printer to the university, by whom she had five daughters; but the other, whose name was Jane, died unmarried, after she had for some time continued to live with her brother. Dr Moor traced his descent from the family which produced Elizabeth Moor, the consort of Robert the Second, and he was duly provided with a genealogical table of his ancestry, but whether it was constructed by himself, we are not distinctly informed. It may however have been as correct as the genealogical tables of some more illustrious families, which occasionally exhibit a tree with some very frail and suspicious branches. He was small in stature, and the measles deprived him of the sight of one eye. From an early age, he discovered an eager thirst of knowledge; and his acquaintance with Andrew Stalker the bookseller, who allowed him the privilege of reading in his shop, seems to have had its effect in encreasing this love of books.

In the month of November 1725 he became a student in the university. The Greek professor of that period was Alexander Dunlop, who was regarded as a zealous and successful teacher. According to a contemporary record, "his thorough knowledge and fine taste in that language, with his masterly and engaging method of teaching it, raised the study thereof, which had been long neglected, unto general esteem and reputation." According to another, and apparently a better, authority, Dr Hutcheson, who became a professor of philosophy in 1729, "had remarkable success in reviving the study of ancient literature, particularly the Greek, which had been much neglected before his time: he spread such an ardour for knowledge, and such a spirit of enquiry every where around him, that the conversation of the students at their social walks and visits turned with great keenness upon subjects of learning and taste, and contributed greatly to animate and carry them forward in the most valuable pursuits."[1] Dunlop published a Greek grammar, which at one time was extensively used in this part of the kingdom. The professor of mathematics was Dr Simson, a man eminently distinguished in his own department of science.[2] Moor imbibed the same ardent love of the ancient geometry, and attained to no mean proficiency in this and other kindred studies. To the study of natural philosophy he applied himself with an equal degree of relish; and, as a proof of his successful exertions, it has been stated that the professor, Dr Dick, "after demonstrating a proposition once to the students, used to make him go over it the second time, instead of doing it himself." On taking the degree of A. M. his early proficiency in science was honourably marked by the testimonial of his having made, not, according to the usual terms, "progressus haud spernendos," but "progressus egregios." About this period he betook himself so eagerly to the study of mathematics, that he left himself no leisure for classical pursuits; and when he resumed the study of the Greek language, he found his knowledge of it so much impaired as to require a laborious renewal. From his own experience he was accustomed to deduce a practical advice, which well deserves to be inculcated; namely, that those who, being chiefly occupied with other pursuits, still wish to retain their classical learning, ought to devote a portion, however small, of every day to classical reading.

After completing his academical course, he kept a school in Glasgow, and, among other branches, taught navigation. When in school, and not actually employed in teaching, we are informed that he was accustomed to read the classics; and from this circumstance we may reasonably infer that the scholars were not numerous, or that they did not sufficiently occupy the master's attention. It however appears, that he speedily relinquished this avocation for that of a private tutor: he was successively connected with the families of the earl of Kilmarnock and the earl of Selkirk,[3]

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[1] Leechman's Life of Hutcheson (p. xxvii.), prefixed to his System of Moral Philosophy. Glasgow, 1755, 2 vols. 4to. The influence of Hutcheson's lectures and writings is very clearly stated by Denina, Discorso sopra le Vicende della Letteratura, p. 224.

[2] Dr Simson regarded him as one of the most promising of his pupils, and has repeatedly mentioned him in his writings. In a letter addressed to Earl Stanhope on the 22d of March 1751, having mentioned the subject of applying the method of the ancients to modern inventions, he proceeds to remark, "My scholars, Mr Moor, Mr Williamson, and particularly Mr Stewart of Edinburgh, may I hope be able to do something this way; and I shall not fail to recommend it to them, and direct them as far as I can." (Trail's Life of Simson, p. 112.) In the preface to one of his publications, he speaks of Moor in these terms: "Quæ sequuntur Græca ex præfatione Pappi Alexandrini ad lib. 7. Collect. Mathem. quam Apollonii duobus de Sectione Rationis libris præfixit clariss. Halleius, cum duobus MSS. in Bibliotheca Regia Parisiensi accurate contulit Dominus Jacobus Moor, tum in mathesi, tum in literis Græcis, quas in hac academia profitetur, multum et feliciter versatus." (Apollonii Pergæi Locorum Planorum libri ii. restituti a Roberto Simson, M. D. Matheseos in Academia Glasguensi Professore. Glasguæ, 1749, 4to.) In the notes to his English edition of Euclid, the subsequent passage occurs: "The learned Mr Moor, Professor of Greek in the University of Glasgow, observed to me that it plainly appears from Archimedes Epistle to Dositheus prefixed to his books of the Sphære and Cylinder, which Epistle he has restored from ancient manuscripts, that Eudoxus was the author of the chief propositions in this book," namely, the twelfth. (Elements of Euclid, p. 425. Glasgow, 1756, 4to.) Dr Williamson, who is mentioned in one of these extracts, became chaplain to the British factory at Lisbon, where he died at an early period of life. Dr Stewart, professor of mathematics at Edinburgh, was the father of Dugald Stewart. "The two greatest mathematicians," says Dr Smith, "that I ever had the honour to be known to, and I believe the two greatest that have lived in my time, Dr Robert Simson of Glasgow, and Dr Matthew Stewart of Edinburgh, never seemed to feel even the slightest uneasiness from the neglect with which the ignorance of the public received some of their most valuable works." (Theory of Moral Sentiments, p. 213.)

[3] Dunbar Hamilton, the son of Basil Hamilton of Baldoon, succeeded to the Selkirk peerage in the year 1744, on the death of John earl of Selkirk and Rutherglen, when he resumed the family name of Douglas. "His lordship's studious disposition induced him to remain several years at the university of Glasgow, where he cultivated the friendship of the celebrated Dr Hutcheson, of whose philosophical opinions he retained through life a warm admiration." (Wood's Peerage of Scotland, vol. ii. p. 489.) He was born in 1722, and died in 1799.

Moor. and he accompanied his pupils to the continent. Of this early portion of his history, some notices have been preserved by his son. "While with the earl of Kilmarnock, he had already made a collection of books which he valued much. It happened, while the earl was from home, that the family-seat was burned. On being informed of it, he said he was chiefly sorry on account of the grief that Mr Moor would feel from the loss of his books. The earl's son was a good scholar; which Mr Moor observing, entered him privately in the Greek without acquainting his father, who for some time knew nothing of his son's new acquisition; until one day that, by his tutor's desire, he read before him an ode of Anacreon, to the great surprise and joy of the earl. While in these noblemen's families, he used to study much, and that chiefly at night, after the others were gone to bed, sitting up late, and keeping himself from being drowsy by drinking strong tea. But by this he hurt his health greatly, and had at times some severe fevers. He was diligent and attentive to his pupils. During the summer, when in the country with one of them at Lochlomond, on going out to walk, he would after a while make him sit down, and taking a classic out of his pocket, make him read to him." As an indication of the opinion entertained of his talents and address, it may be mentioned, that in the year 1746, when the earl of Kilmarnock was attainted of high treason, Moor, who was very far from participating in his political opinions, was despatched to London for the purpose of lending his aid in those solicitations of mercy which were ineffectually addressed to the ministers of the crown. The unfortunate nobleman was beheaded on Towerhill, and his hereditary honours were forfeited; but his eldest son, a man distinguished by the amiableness of his character, as well as the elegance of his person and manners, succeeded to the title and estate of his maternal grandfather the earl of Errol.

Moor's first preferment was that of librarian to the university. At that period the office was only tenable for four years, and the nomination alternately belonged to the university and the town-council. On the 11th of November 1742 he was appointed by the university; and in the ensuing month of May he received from the council a similar appointment, which was to take effect at the expiration of his first period of four years. The earliest work in which he is known to have had any participation appeared under the following title: "The Meditations of the Emperor Marcus Aurelius Antoninus, newly translated from the Greek; with notes, and an account of his life." Glasg. 1742, 12mo. A second edition was printed in 1749, and a third in 1764, each consisting of two volumes. One of the early projects of Dr Robertson was a version of the same author; but finding himself thus anticipated, he did not persist in his design.[1] The first two books were translated by Dr Moor, and the other ten by Dr Hutcheson, but the work was published without their names.[2] Gataker, one of the most learned of modern critics, had illustrated the original text with great depth of erudition. Moor. "The golden Boke of Marcus Aurelius Emperour and eloquent Oratour" was "translated out of Frenche into Englishe by John Bourchier, Knighte, Lorde Barners," and in this form passed through several editions. It was translated from the Greek by Meric Casaubon, the learned son of a more learned father. It was afterwards translated, in a style singularly quaint and ludicrous, by Jeremy Collier. A new version was published in 1747 by James Thomson, and another in 1792 by Richard Graves.

Professor Dunlop, who had filled the Greek chair for upwards of forty years, was at length induced to resign it; and on the 27th of June 1746 Moor was unanimously elected to the office which he had vacated. He was inducted on the 9th of July, when, as a probationary exercise, he read a critical disquisition on the tenth chapter of Longinus. Dunlop, as emeritus professor, retained his house and salary; and he moreover received from his successor the sum of six hundred pounds, which was advanced by the earl of Selkirk.[3] Such a transaction suited the commercial spirit of the place, nor is this supposed to have been the most recent bargain of a similar denomination. Dunlop did not survive beyond the ensuing month of April; and in the course of the same year, 1747, the new professor resigned his office of librarian. The summer of 1748 he spent in France, but not for the purpose of mere relaxation. He still continued to blend the study of classical literature with the study of the mathematical sciences; and at this period he was occupied with preparations for an edition of the Greek text of Pappus, whose Mathematical Collections, as Dr Trail has stated, are "the chief repository of information respecting the geometry of the ancients, and especially respecting their analysis, which has been the subject of much discussion among the moderns. This most interesting work contains some curious mathematical history of former times, but is more particularly valuable by the account, contained in the preface to the seventh book, of the treatises of the analytical geometry of the ancients, which together obtained the name of τόπος ἀναλυομένος. In this preface there is, first, a general exposition of the analysis employed by the ancients, both in the solution of problems and in the demonstration of theorems; then follows a particular description of the nature and contents of a certain number of these treatises, which we may presume were considered by Pappus as the most important; and an enumeration of the whole is added, consisting of thirty-three books. The seventh book of Pappus itself consists of a number of lemmata, or subsidiary propositions, not contained in Euclid, but assumed or employed in the several treatises which are so fully described in the preface."[4] In his researches at Paris, Moor appears to have received some assistance from Capperonnier, the royal professor of Greek.[5] It is however to be regretted that he did not persist in this undertaking; nor is it improbable that his

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[1] Stewart's Life of Robertson, p. 8.

[2] This translation was, after an interval of two years, followed by an edition of the original work. "Marci Antonini Imperatoris eorum quæ ad seipsum libri xii. post Gatakerum ceterosque recogniti; et notis illustrati, a doctissimo viro R. I. Oxoniensi." Glasguæ, 1744, 8vo. It is inscribed, in the name of R. Foulis, to Dunbar Hamilton, "ob præclarum ejus studium, in literis antiquis, in philosophia, et in omnibus bonis artibus, sive ad vitam et mores, sive ad rempublicam spectent, excolendis." The edition was probably superintended by Dr Moor. The notes are reprinted from the Oxford edition of 1704. At the end of the translation of Antoninus, the following advertisement occurs: "The Printer gives this public notice, that the Translation of Antoninus will be followed by another, of the Dissertations of Epictetus preserved by Arrian, and not yet in English. A considerable part of it is already finished; and the whole will ere long be published." We are not aware that this version ever made its appearance.

[3] This statement rests on the authority of some manuscript notices of Dr Moor, written by his son, the late Mr James Moor, master of Irvine school. They were procured by the kindness of an amiable and accomplished man, who has likewise quitted this transitory scene, Lockhart Muirhead, LL. D. Professor of Natural History, and Principal Librarian of the University of Glasgow. Dr Muirhead supplied most of the notices relative to Moor's academical history.

[4] Trail's Account of the Life and Writings of Robert Simson, M. D. late Professor of Mathematics in the University of Glasgow, p. 11. Bath, 1812, 4to. In his appendix, Dr Trail has given a detailed account of the Mathematical Collections of Pappus.

[5] Capperonnier, in a letter addressed to Professor Stoeber of Strasburg, and dated at Paris on the 8th of November 1748, speaks

Moor. attention was diverted by his participation in the more magnificent project of a complete and splendid edition of the works of Plato. Such a project was first entertained by the university printers about the year 1746. In 1751 Robert Foulis repaired to the continent, furnished with letters of recommendation from Moor to Capperonnier and Sallier, who both belonged to the establishment of the Royal Library at Paris. He first proceeded to Holland, where he endeavoured to secure the assistance of Hemsterhusius and Alberti ;[1] and before his return home, he had seen many manuscripts of Plato, or had ascertained where they were to be found, and had devised means for obtaining collations of those preserved in the Royal Library and in the Vatican. Of the proposals issued for this edition, we subjoin a copy, which cannot fail to excite some degree of interest in the classical reader.

" Glasgow, January 7, 1751.—Robert and Andrew Foulis, Printers to the University, propose to print by subscription the Works of Plato, on a new Type, the largest of the Louvre sizes, just now cut by Alexander Wilson, M. A. Type-founder to the University: in quarto and in folio. I. In IX. volumes in quarto, of which the Greek in 6 volumes, and the Latin translation, with the notes, in 3: the price to subscribers, one penny sterling per sheet. The whole will be contained in about 500 sheets; so the price will be about 2l. 1s. 8d. in quires, on a fair paper. A number will be printed on a fine large paper, at twopence sterling per sheet. II. In VI. volumes in folio, with the translation on the same page, below; likewise at one penny per sheet; and in about 740 sheets; which will amount to about 3l. 1s. 8d. A number also on the finest writing paper (the same on which we printed Cicero), at three half-pence per sheet; which will amount to about 4l. 12s. 6d. The Greek shall be accurately printed from the edition of H. Stephens. The various readings, and his own conjectures, printed on the margin of his edition, shall be printed at the bottom of each page. Any other readings we can procure, or conjectural emendations, shall also be printed at the bottom of each page, or at the end of the work, with proper distinctions. The notes of H. Stephens, relating to the Greek text, which are printed at the end of his edition, shall also be printed at the end of this. Also all other notes of any merit, published since his edition, and all which we can procure besides.[2] The translation will be that of Ficinus; but with several corrections published since, and all others which we can procure. Moor.

" The Publishers propose to demand no money at subscription; only beg leave to reserve it in their own choice, to call for, at delivery of the volume first printed, which will contain the Laws and Epinomis, one guinea of the whole price, upon their note to deliver the rest of the work according to the above terms. N. B. The Laws and Epinomis make about a fifth part of the whole of Plato's works.—Gentlemen who chuse to favour this undertaking, and are at a distance, will very much oblige the Printers if they take the trouble themselves of transmitting their names to Glasgow, and as quickly as possible; or if, at least, they give notice to the Printers, of the person with whom they have subscribed. By either of these means, but especially by the former, the undertakers will both have the satisfaction of knowing their encouragers, and of having it in their power to prevent gentlemen from being disappointed of their copies, or in the size or paper they had chosen.

" As the undertakers are to do their utmost to render this edition the most extensively useful, they take this occasion of inviting gentlemen of learning every where to communicate what helps they can, either for establishing the text, correcting the version, or illustrating the philosophy. Whatever of this kind is received shall be gratefully acknowledged, printed with the author's name, if not forbid, and his labour suitably rewarded."

Dr Moor, after some hesitation, undertook the formidable task of editor; and it is certainly to be regretted that the publishers did not persevere in a scheme which presented so fair a promise of honour and emolument. Among those by whom it was zealously encouraged we find two individuals who at least resembled each other in their love of ancient literature, namely, Bishop Berkeley and John Wilkes.[3] This scheme was not finally abandoned till the year 1759, when the printers found themselves too deeply involved in an abortive and ruinous project of an academy or institution for the fine arts. In the mean time, the professor was occupied with a variety of pursuits closely connected with the duties of his office. Of his grammar of the Greek language, the earliest fragment, consisting of only 72 pages, was published with the fol-

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of Moor in very favourable terms. " Nous avons vû ces jours derniers à Paris un professeur en langue Grecque de Glasgow en Ecosse, qui travaille sur les mathématiciens Grecs, et, entre autres, qui prépare une édition du Pappus d'Alexandrie, auteur, comme vous sçavés, qui n'a jamais été imprimé. Il lui manque le septième livre, qui fait seul un grand tiers de l'ouvrage. Je me suis chargé à sa considération de le lui copier, et je vous assure que cela me donne bien de la peine. Ce professeur s'appelle M. Moor: il est très instruit, et me paroit un fort honnête et fort galant homme." (Classical Journal, vol. v. p. 392.) From M. de Mairan, of the Academy of Sciences, he purchased a beautiful folio MS. of Pappus, containing the third, fourth, fifth, sixth, and eighth books. According to the statement of its former possessor, it had once belonged to Bullialdus; and in Dr Simson's papers it is repeatedly described as *Codex Bullialdi*. (Trail's Life of Simson, p. 177.) It is now deposited in the Advocates Library; but of Capperonnier's transcript of the seventh book no trace is to be found.

[1] " Edenburgensibus novam editionem molientibus ante viginti annos, eumque rogantibus ut operam ipsis suam addiceret, ita responderat, ut se ab eorum instituto non alienum ostenderet." (Wyttenbachii Vita Ruhnkenii: Opuscula, tom. i. p. 698. Lugd. Bat. 1821, 2 tom. 8vo.) For *Edenburgensibus*, we must apparently read *Glasguensibus*.

[2] Their collections were at length purchased by the late Mr Laing, an eminent bookseller of Edinburgh, in whose Catalogue of 1792 they are mentioned in detail. It is stated in more general terms that " they consist of corrections upon the Latin version, critical and philological remarks, illustrations of the philosophy, collations of printed editions, scholia not hitherto published, and collations of all the ancient MSS. extant of that author, procured from the continent, for establishing the text, with much labour and at a very great expence." Of the Basel edition of Plato, 1534, it is said that " the principal value of this copy arises from the labours of Dr Moor. For many years his attention was principally directed to this work. The margins have, in his hand-writing, collations with other printed editions, corrections upon the text, philological and critical remarks, &c. Much labour appears also to have been bestowed on the commentary of Proclus." The entire collection was ultimately purchased for the Bodleian Library at Oxford.

[3] Bishop Berkeley, writing to his friend Thomas Prior on the 30th of March 1751, mentions their scheme in the following terms: " They are going to print at Glasgow two editions at once, in quarto and in folio, of all Plato's works, in most magnificent types. This work should be encouraged: it would be right to mention it, as you have opportunity." See Bishop Stock's Memoirs of George Berkeley, D. D., late Bishop of Cloyne in Ireland, p. 155. 2d. edit. Lond. 1784, 8vo. On the same subject, a letter from Wilkes to R. Foulis, dated at London on the 3d of December 1746, has lately been printed in Mr Duncan's Notices and Documents illustrative of the Literary History of Glasgow, during the greater part of last Century, p. 54. Glasg. 1831, 4to. " I have since mentioned this," he remarks, " to Mr Professor Ward of Gresham College, and to several other friends, who are very willing to encourage so useful a design; and I am desired to write to you, to beg you would send us printed proposals. We may venture to assure you of one hundred subscriptions from the circle of our own acquaintance."

Moor. lowing title: "De Analogia Contractionum Linguæ Græcæ Regulæ generales. Præmissæ sunt Nominum Declinationes; et adjectæ Regulæ de Temporibus formandis. In usum Tironum Juniorum Classis Græcæ in Academia Glasguensi." Glasguæ, 1755, 8vo. An edition of his Grammar was printed in 1766; and after an interval of four years, the work appeared with its final improvements: "Elementa Linguæ Græcæ; novis plerumque Regulis tradita, brevitate sua memoriæ facilibus. Pars prima, complectens Partes Orationis declinabiles, et Analogiam duas in unam Syllabas contrahendi, ex ipsa Vocalium Natura deductam, et Regulis universalibus traditam. In usum Tyronum, &c. Editio nova, prioribus auctior et emendatior. Studio Jacobi Moor, LL.D. in eadem Acad. Litt. Græc. Prof." Glasg. 1770, 8vo. This grammar, as the title indicates, is still incomplete: it not only omits the particles, or indeclinable parts of speech, but likewise syntax, prosody, and accentuation; but, so far as it extends, it is a work of very uncommon merit. The author's familiarity with the Greek geometry was perhaps of some advantage to him as a grammarian. To the discussion of grammatical subjects he has applied no inconsiderable degree of philosophic acumen; and here we sometimes meet with instances of a beautiful analysis, especially in that portion of his work which relates to the contraction of nouns. Of Moor's grammar, the subsequent editions are very numerous. Some editors have illustrated his book with annotations, and some authors have without much scruple availed themselves of his labours. During his own lifetime, a charge of this kind was preferred against Lord Monboddo, by an anonymous writer in a periodical work edited by Dr Stuart. "We have formerly remarked this author's obligations to Mr Harris; and the charge of having borrowed liberally from Professor Moor, without a proper acknowledgement, has been urged very generally against him. The curious reader may see p. 506. 507. 517.[1] and may then consult Elem. Ling. Græc. studio Jac. Moor, p. 121. 160. But it is not only of what this acute grammarian has published, that he, in all probability, has availed himself. It is well known to those who have heard Dr Moor's lectures in the university of Glasgow, that the whole of what is laid down in the book before us, upon the derivation and composition of the Greek language, was repeatedly inculcated by him to his pupils; and it is to be hoped that some of these, out of gratitude to their ancient and languishing master, will undertake the task of doing him compleat justice, and of wielding, in his defence, that lance which his feeble arm can no longer sustain."[2]

A few years after the first appearance of his grammar, he published a neat little volume entitled "Essays, read to a Literary Society, at their weekly Meetings within the College of Glasgow. I. On the Influence of Philosophy upon the Fine Arts. II. On the Composition of the Picture described in the Dialogue of Cebes. III. On Historical Composition." Glasg. 1759, 8vo. He has prefixed a dedication of this tenor: "To the Right Honourable James Earl of Errol, Lord High-Constable of Scotland, these Essays, on the taste of some of the chief Greek writers, whose works his Lordship has the pleasure of admiring in the original, having at a very early time of life made in that language a very uncommon progress; are, with every sentiment of respect, duty, and gratitude, inscribed by Ja. Moor." The second of his essays, which is perhaps the most valuable, exhibits a successful attempt to explain the propriety and consistency of the picture delineated by the Socratic philosopher with so much beauty of moral colouring. Of this ancient relique he entertained a fervent admiration; and in the year 1747 he had published an edition of Cebes, with some brief annotations.[3] He afterwards prepared for the press "Spartan Lessons; or, the Praise of Valour, in the Verses of Tyrtæus, an ancient Athenian Poet, adopted by the Republic of Lacedæmon, and employed to inspire their Youth with Warlike Sentiments." Glasg. 1759, 4to. To this publication, which does not bear his name, he prefixed a characteristic inscription. "These Remains of ancient Panegyric on martial Spirit and personal Valour, of old the daily lessons of the Spartan youth, are with propriety inscribed to the young Gentlemen lately bred at the University of Glasgow, at present serving their country as Officers of the Highland Battalions now in America." To the same military gentlemen he has addressed his account of Tyrtæus, which extends to twenty-four pages. Besides the Greek text, with the Latin version of Stephanus, he has given eight pages of "Observations on the Greek Text, which occurred while the preface was at the press." This may be considered as rather a perfunctory method of performing such a task, which would have required some degree of research and deliberation; and indeed the preliminary account of Tyrtæus is not written with an adequate portion of critical care and precision. It is observable that he does not even mention the name of Callinus the Ephesian, to whom Stobæus ascribes the second fragment. Of this very ancient Greek poet, the history has lately been investigated by Franck with great erudition and acuteness. He arrives at the conclusion that Callinus, author of the fragment in question, flourished long before the age of Tyrtæus, that he even preceded the age of Hesiod; and that he was the earliest writer of elegiac verse of whom we can discover any reliques, or of whom the ancients themselves have preserved any record.[4]

The next English work published by Dr Moor bears this title: "On the End of Tragedy, according to Aristotle; an Essay, in two parts." Glasg. 1763, 8vo. The brief passage in the Poetics to which this essay relates, has in no small degree puzzled the modern critics.[5] According to the common interpretation, we are told that tragedy, by means of pity and terror, effects the purgation of the passions. "Now," as Dr Moor has remarked, "the difficulty which they find here is, to explain in what manner tragedy, by exciting the two passions of terror and pity, at the same time refines and purifies them; or, in what sense we are to understand that tragedy proposes to refine and purify these two passions by the very means of exciting them." Since the days of Castelvetro and Robortelli, innumerable attempts have been made to explain the passage, so as to draw from it some consistent and forcible meaning. According to some commentators, this purgation of the passions merely arises from the moral influence of contemplating the direful effects produced by their excessive or unregulated indulgence. According to others, the process of purgation or purification is accomplished by that excitement of the passions which attends the repre-

[1] See Lord Monboddo's Origin and Progress of Language, vol. ii.

[2] Edinburgh Magazine and Review, vol. i. p. 370.

[3] Ὁ τοῦ Κέβητος Πίναξ. Accedit interpretatio Latina, ex editione Jacobi Gronovii. Glasguæ, 1747, 12mo. 1757, 8vo. 1771, 8vo. Moor was probably the editor of Aristotle's Poetics. Glasg. 1745, 8vo.

[4] Jo. Valentini Franckii, Philos. D. Callinus; sive, Quæstionis de Origine Carminis Elegiaci Tractatio Critica. Accedunt Tyrtæi Reliquiæ, cum procœmio et critica annotatione. Altonæ et Lipsiæ, 1816, 8vo.

[5] Ἔστιν οὖν τραγῳδία μίμησις πράξεως σπουδαίας καὶ τελείας, μέγεθος ἐχούσης· ἡδυσμένῳ λόγῳ, χωρὶς ἑκάστου τῶν εἰδῶν ἐν τοῖς μορίοις· δρώντων, καὶ οὐ δι' ἀπαγγελίας· δι' ἐλέου καὶ φόβου περαίνουσα τὴν τῶν τοιούτων παθημάτων κάθαρσιν. (Aristotelis de Poetica liber, p. 18. edit. Tyrwhitt. Oxon. 1794, 8vo.)

Moor. sentation of the tragic drama:[1] pity and terror, on being frequently excited, gradually become less violent in their influence upon the mind, as a familiarity with all objects has a tendency to diminish the intensity of their effect on the senses. Other explanations, or the different modifications of these two, it is here superfluous to mention. That he was dissatisfied with all of them, cannot perhaps excite much surprise. He contends that Aristotle nowhere calls the passions παθήματα; that the word by which he uniformly describes them is πάθη; and that the former term always denotes sufferings or calamities. The signification of the verb καθαίρω, and the cognate substantive κάθαρσις, he has carefully illustrated in the second part. "Thus," he at length avers, "I hope I have pretty fully proved that καθαίρειν signifies to clear away, to remove entirely, and that this is even its proper and primary signification: consequently, κάθαρσις must of course signify removal; and therefore ἡ παθημάτων κάθαρσις is an expression not liable, at least, to any imputation of impropriety. But I will venture to go farther, and to say that it is introduced here with a nice and beautiful propriety: for the words καθαίρειν and κάθαρσις, from that first and simplest use which I have hitherto been mentioning; I mean, to express the removal or clearing away of whatever is amiss in external things; from that they came soon to be applied to the removal of things amiss within, whether within the body or the mind; for, as every one knows, they became even *voces signatæ* in medicine for one method of removing what is amiss in the body, or the cause of bodily disorder; and, from medicine, they came to be used for expressing the removal of what is amiss, or the cause of disorder, in the mind." And thus, according to his hypothesis, "tragedy, by exhibiting such calamities on the stage, would propose for its end and intention, καθαίρειν, to remove such calamities out of human life; and propose to accomplish that end by exciting the pity and terror of the audience at the representation of them." His explanation is certainly ingenious and plausible; whether it is perfectly correct, may admit of some doubt. What is stated as to Aristotle's application of the words παθήματα and πάθη, is not altogether accurate: he frequently uses the latter word to denote sufferings, and sometimes the former to denote the passions. This is one material objection to the professor's explanation; and another is to be found in a parallel passage of the author's treatise *De Republica*, lib. viii. cap. vii. For, as Twining has remarked, "whatever be the meaning of the term κάθαρσις, or purgation, here, must also be its meaning in the treatise on poetry; since to that work Aristotle refers for a fuller explanation of it. The only difference is, that here the term is applied to the effect of imitative music; there to that of imitative poetry; of the species of it however which depended, we know, upon music for a very considerable part of its effect."[2] In this parallel passage, as he subjoins, it is evidently the author's idea that pity is to be purged by pity, terror by terror. Here it is obvious that the hypothesis which we have been considering cannot apply with any measure of propriety.

In another tract, printed three years afterwards, Dr Moor gave a new proof of the acumen with which he was accustomed to investigate subjects of grammar and philology. "On the Praepositions of the Greek Language; an Introductory Essay." Glasg. 1766, 8vo. The general tendency of his speculations may be understood from the following quotation. "Having gone thus far with each praeposition, not without some satisfaction and encouragement to proceed, tho' far from being fully assured that I was right, I took a careful review of them all, comparing these radical significations together. From which survey of the whole, compared also with the flexions of nouns, I imagined that I did plainly perceive the true use and design, in the Greek language, of that part of speech called praeposition: viz. that the three chief circumstances of relation, or connexion, in human life, are expressed by the flexions of nouns in the three oblique cases; and that all other circumstances of relation or connexion are expressed by the praepositions. By the three chief circumstances of relation or connexion in human life, I mean *possession*, *interchange*, and *action*. Possession, or the relation between the possessor and that which he possesses, by the genitive case; interchange, or mutual communication, whether of words or things, by the dative case; action, or the relation between the agent and what he acts upon, by the accusative case. All other relations were, I thought, in Greek, expressed by the praepositions. These other relations all refer to *rest* or *motion*, *place* or *time*; and are what the schoolmen would call the 'accidentia motus et quietis, loci et temporis.' According to the mutual connexion between the ideas of place and time, all praepositions express place and time equally; tho' perhaps place was the primary idea or signification in all of them. With respect to motion and rest, some praepositions express only the one of these; and then they govern only one case. Others express both; and then they govern two cases; one when they express motion, the other when they express rest." From his speculations on this subject, the praise of acuteness and ingenuity cannot be withheld. The correctness of his theory of the Greek prepositions has however been called in question by several writers, particularly by Mr Tate, who has stated several objections that appear to be material.[3]

Moor. Nearly at the same time, he published his "Vindication of Virgil from the Charge of a Puerility, imputed to him by Doctor Pearce, in his Notes on Longinus; an Essay." Glasg. 1766, 8vo. Each of these three tracts bears on the title-page that it was "read to a Literary Society in Glasgow, at their weekly Meetings within the College." This society was founded in the year 1752, and was originally constituted by only twelve members, three of whom were Moor, Smith, and Cullen. Many others were afterwards added; and among these we find Simson, Black, Reid, and Millar. All these names are so conspicuous in the literary annals of their country, that the university to which they belonged cannot be mentioned but with respect. Beside the six essays which have been enumerated, Dr Moor read several others, which were never printed. November 30,

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[1] "Quid sibi velit Aristoteles," says Hermann, "unumquemque, qui tragœdias spectaverit, facile sensus suus docebit. Animo commotie spectaculo redimus, sed ea est hæc commotio, quæ ab omni humilitate, ab omni inhonesta cupiditate aliena sit. Cujus rei caussam non recte indicavit Aristoteles, qui tragœdiam dicat δι' ἐλέου καὶ φόβου περαίνουσαν τὴν τῶν τοιούτων παθημάτων κάθαρσιν. Non enim per miserationem et terrorem istiusmodi purgatio animi perficitur, sed per sublimitatem, quam quum omnium maxime in tragœdiæ definitione commemorare Aristoteles deberet, omnium minime tetigit. Hac enim fit, ut et miseratione et metu majores nos esse sentiamus, nec percelli nos his animi motibus patiamur. Id vero est animi commotiones purgatas habere, tangi iis, nec vinci. Quod si, ut putat Aristoteles, per ipsas illas commotiones hoc efficeretur, etiam fabulæ, quas nunc mulierculis et eviratis scribit Ifflandius, homines reddere deberent celsiores." (Aristotelis de Poetica liber, cum commentariis Godofredi Hermanni, p. 115. Lipsiæ, 1802, 8vo.)

[2] Aristotle's Treatise on Poetry, translated, with notes on the translation, and on the original, and two Dissertations, on Poetical, and Musical, Imitation, by Thomas Twining, M. A. p. 236. Lond. 1789, 4to.

[3] Tracts on the Cases, Prepositions, and Syntax of the Greek Language. By James Moor, LL. D. Professor of Greek in the University of Glasgow, and James Tate, M. A. Master of the Grammar School of Richmond in Yorkshire, and formerly Fellow of Sidney College, Cambridge. Richmond, 1830, 8vo.

Moor. 1764. On the Structure of the Greek Language, and the Method of ascertaining the Meaning of the Particles of that Tongue. November 29, 1765. Remarks on Dr Warburton's Critical Notes on Mr Pope, in the last edition of his Works. December 9, 1769. Some Observations on the Genius of English Verse.

All his original works have now been enumerated, but he is known to have lent his aid in the preparation of various editions of Greek classics which issued from the university press. The Greek typography of Glasgow was long pre-eminent for its elegance. His edition of the Arenarius of Archimedes, without preface or annotation, has been considered as valuable for the accuracy of the text.[1] It is a small folio of thirty-two pages, without a Latin title, and without a date. Of the elegant and correct edition of Herodotus, published in the year 1761 in 9 vols. 8vo, he is expressly mentioned by his son as having had the inspection. He may probably have rendered a similar service to the edition of Thucydides, published in the year 1759 in 8 vols. 8vo. But of the Glasgow press at that period, the great boast and ornament is the splendid and accurate edition of Homer. The editors were Dr Moor and Mr Muirhead, professor of humanity; and the edition consists of four volumes in small folio. The two volumes containing the Iliad appeared in 1756; and the remaining two, containing the Odyssey, Hymns, and other reliques, followed in 1758. A preface to the Iliad, subscribed by both editors, but probably written by the Greek professor, gives a minute account of the method pursued in the revisal of the text. Every sheet was read six times before it was sent to press; twice by the ordinary corrector, James Tweedie, once by Andrew Foulis, once by each of the editors separately, and finally by both conjunctly.[2]

As a relaxation from severer studies, Dr Moor occasionally indulged his fancy in the composition of English, and even of Scotish verses. A collection, published so early as the year 1751, contains his "Verses sacred to the Memory of the Honourable Alexander Stuart, Master of Garlies: inscribed to the Right Honourable Lord Boyle."[3] This poem, which is written in blank verse, we ascribe to him on the authority of the late Professor Richardson, who must have been well acquainted with his personal and literary history. The young gentleman here commemorated was the eldest son of Alexander Lord Garlies, afterwards the sixth earl of Galloway. He died at Aix-la-Chapelle in the year 1738, and the verses were probably composed soon after that event. Another of his poems, entitled the Linnet, or Happiness at Home, was in 1775 printed in a periodical work, under the name of the author.[4] Several short poems, ascribed to him, have been published at a more recent period.[5] One of these is a popular song, entitled the Chelsea Pensioners, and beginning, Moor.

When war had broke in on the peace of auld men.

Such were the various accomplishments, and such the diversified pursuits of Dr Moor; who, as Mr Stewart has well remarked, "combined with a gaiety and a levity foreign to this climate, the profound attainments of a scholar and a mathematician."[6] This gaiety of disposition exposed him to some mischances, and did not leave the respectability of his character altogether unimpaired. He lived and died unmarried, but during a great part of his life was subjected to female influence, not of the most refined denomination.

Ὑμῖν δ' ἐπαινῶ γλῶσσαν εὔφημον φέρειν,
Σιγᾶν θ' ὅπου δεῖ, καὶ λέγειν τὰ καίρια.

Of his personal history, little now remains to be told. On the 16th of May 1759, he had been nominated vice-rector till Dr Leechman's state of health should permit him to reside in college. His noble pupil the earl of Errol, having been elected rector, appointed him vice-rector on

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[1] Professor Rigaud of Oxford read a paper to the Ashmolean Society on the 11th of November 1836, giving "a general account of the contents of the Arenarius, of the method invented by Archimedes for the enumeration of very large numbers, and his artifice on the principle of logarithms, for finding the value of their products. It then entered on the state in which the Greek text of this treatise is now preserved to us. The first critical edition was that which Dr Wallis published at Oxford in 1676, which is very valuable, although he had not the advantage of any manuscript to assist him, but principally depended for his authority on the imperfect text of Hervagius. Torelli, in preparing the edition of the works of Archimedes, which was published at Oxford in 1792, professes to follow Wallis, and indeed departs only in a very few places from what he had adopted. Torelli most probably was not aware that a much better text of the Arenarius had been printed in Great Britain many years previous to the completion of his own labours. The book, indeed, is very scarce, as it was never published, and only a few copies got abroad. Any one acquainted with the characters of Foulis's printing, must have immediately recognised the press at which it was executed; but it never had any regular title-page; and no particulars would probably be now known of it, if Mr Barnwell had not preserved them in a note, which he has inserted in a copy belonging to the British Museum. From that valuable memorandum, we learn that the editor was Dr Moor, Professor of Greek at Glasgow; and that he used a MS. for it, which had been lent him by the Abbé Sallier, as it is said, out of the French king's library. He appears to have sent it back in 1751; but Mr Barnwell, in 1828, could find no traces of it in that extensive collection at Paris; nor was any further clew discovered to an original authority for Dr Moor's very superior readings, till a MS., in 1830, was left by Mr Powell, of Balliol, to the Observatory at Oxford. In this Mr Barnwell immediately observed a coincidence with the peculiar text of the Glasgow edition; but reasons were given in Professor Rigaud's paper for doubting whether it was the identical MS. used by Dr Moor; and if it was, whether it had ever belonged to the Royal Library at Paris. Anderson, in his translation of the Arenarius, published in 1782, alludes to Dr Moor's (which he only knew as an anonymous) edition; and, from mistaken caution, rejects the decided improvements which it affords. There is an old Latin translation which Hervagius added to his publication, although it essentially differs from his Greek text. Mr Anderson suspected that the Glasgow edition was altered, and accommodated to this Latin, without considering (what is now indiputably clear), that, by their agreement, the one became a confirmation of the other."

[2] In the Advocates Library there is a quarto volume of Moor's Papers, chiefly consisting of brief annotations on Greek and Latin writers. Among other scraps, it contains the following: "*Erratum duplex* in the Glasgow Homer, Iliad π. 857. Pro ἀνδροστῆτα lege ἀδροστῆτα. N. B. I do firmly believe that this is one of the mad impudences of Ja. Tweedie, whom I have caught in many pranks of this kind." The volume contains a letter from Lord Hailes to Dr Moor, dated at Edinburgh on the 20th of August 1757, recommending the plan of publishing a collective edition of the fragments of the Greek lyric poets, and communicating some emendations of Alcæus, Sappho, and Anacreon. "As I understand by our friend Mr Smith," says this learned judge, "that you have made some emendations upon Anacreon, I cannot but testify my desire that you apply your thoughts to the fragments of the Greek lyrics, which are excellent, as you know, and much corrupted. An edition of such fragments as comprehend a compleat sentiment, if published by you, would be an acceptable present to the learned world."

[3] Poems on Moral and Divine Subjects, by several celebrated English Poets, p. 377. Glasgow, 1751, 8vo.

[4] Edinburgh Magazine and Review, vol. iv. p. 648.

[5] Lives of eminent Scotsmen, part v. p. 114. Lond. 1821–2, 3 vols. 12mo. The fifth part includes a miniature portrait of Moor. "From the specimens now given," says the anonymous author, "it will be seen that Dr Moor's claims to poetic rank are of no ordinary cast. The Chelsea Pensioners and the Mistake are distinguished by a dryness of humour and truth of colouring, which have not often been surpassed. They evince powers which only required to have been cultivated, to place their author on a level with the very best of our minor poets."

[6] Stewart's Life of Reid, p. 47.

Moore. the 1st of September 1761. In consideration of his talents and learning, the degree of LL.D. was conferred upon him on the 26th of April 1763. On the 14th of June 1766 he was elected clerk of the university. His constitution had never been vigorous, and about this period his health was much impaired: he therefore obtained the permission of the senate to employ John Young in teaching his classes during the ensuing session. Although he afterwards found his health somewhat improved, he never recovered any considerable degree of strength. On the 5th of May 1774 he resigned his professorship, on condition of being allowed to retain his house and salary. He was succeeded by Mr Young, who was likewise a man of talents and learning, and who was long conspicuous as a zealous and efficient instructor of youth.[1] The declining years of Dr Moor were less comfortable than his friends could have wished, or might have expected. His early connexion with men of rank had no tendency to train him in habits of economy, and his domestic concerns were not placed under the best management. Such were the embarrassments of his situation, that in the month of November 1767 his household furniture was distrained. Two years afterwards, he sold to the university his collection of medals for the sum of thirty-two pounds. It is more to be regretted that his library, which was of very considerable extent and value, was likewise sold during his own lifetime;[2] a circumstance which could not but be attended with deep mortification to an individual of his taste and feelings. He died on the 17th of September 1779, after having completed the sixty-seventh year of his age. (x.)

MOORE, Dr John, was the son of one of the clergymen of Stirling, at which place he was born in the year 1730. He received his medical education at the University of Glasgow, and at the early age of seventeen he served as surgeon's mate with the army in Flanders. After the conclusion of peace, he prosecuted his medical studies at Paris, where he was appointed surgeon to the household of the English ambassador, Lord Albemarle. On his return to Scotland, he settled as a surgeon at Glasgow; and there he quickly rose to extensive and successful practice. In every period of his life he delighted in social intercourse; and during his residence in Glasgow, his leisure hours were, in a great measure, devoted to the enjoyment of society. His vivacity in conversation, and agreeable turn of wit and humour, attracted around him a numerous and respectable circle of acquaintances. Although he did not at this period come before the public as an author, he often wrote occasional poems on the occurrences of the day, for the amusement of the society which he frequented, and of which he formed the principal charm. His acute and just discrimination of the various shades in the manners and dispositions of mankind was even at this time displayed in a series of verses, characteristic of the members of a convivial club to which he belonged.

In the year 1769 he was called, in his medical capacity, to attend the young Duke of Hamilton, who was labouring under a pulmonary complaint, to which he ultimately fell a victim. His attendance at Hamilton subsequently led to his accompanying the brother of his patient to the continent. An extensive and long-continued tour through Italy, France, and Germany, opened a wider range to his faculty of investigating the characters of mankind than he had hitherto enjoyed. After spending five years abroad, he settled as a physician in London; and about the same time commenced his literary career, by publishing the fruits of his travels in his View of Society and Manners in France, Switzerland, and Germany. This work was so well received that, in the year 1781, he added to it two volumes, entitled A View of Society and Manners in Italy. A discriminating observer of the customs, passions, and prejudices of mankind, he was admirably qualified to give a correct and interesting view of society and manners in the countries through which he had travelled; and, by means of the epistolary form which he adopted, he has completely succeeded in giving sufficient connection and animation to his Miscellaneous Anecdotes, his Sketches of Distinguished Men, and his Remarks on National Character. In 1785 he published his Medical Sketches, consisting chiefly of observations on the Animal Economy and the treatment of Fevers. His next performance, which appeared in the year following, was the celebrated novel of Zeluco, in which he has exhibited a character so atrocious as rather to excite horror than to afford amusement or instruction. The only prototype of such a personage in fictitious narrative (for surely none ever existed in real life) is the Ferdinand Count Fathom of Smollett, which Dr Moore, doubtless, had in his eye when he undertook this singular delineation. Both characters are utterly devoid of principle, and are equally profligate, perfidious, and selfish. Yet there are different shades in the characters of these fictitious wretches; Zeluco is a more daring and hardy, Fathom a more pliant and crafty, villain. Fathom, too, in the commission of all his atrocities, is solely actuated by self-interest, or the indulgence of the lowest sensual gratifications; whereas Zeluco is excited to many of his blackest crimes by the strongest evil passions of our nature, by hatred, envy, and revenge. Fathom has perfect command of temper, and never sacrifices his interest to caprice. Zeluco's temper, on the other hand, is ungovernable, and he disregards all consequences in the gratification of his rage and malice. The moral effect of all such pictures of depravity may well be doubted. Fathom, indeed, who is represented as a coward, a thief, and a sharper, is so utterly degraded, loathsome, and disgusting, that the contemplation of his character is only for the time a pollution of the imagination. But the high birth, personal attractions, gentlemanlike accomplishments, and courage of Zeluco, may, to an ill-regulated mind, extenuate his enormities, and even spread the infection of his wickedness. It is true, that the history of Zeluco, who is the only son of a noble and wealthy family in Sicily, is intended to show the fatal consequences of uncontrolled passions, and excessive maternal indulgence. It is true, that, with every advantage of person, birth, and fortune, he is represented as utterly wretched from the depravity of his nature; that an awful punishment is awarded to him in the catastrophe, and that he closes his life in paroxysms of penitence. But though the author's design may have been laudable, the moral scope is often as much lost sight of in the perusal as are the recondite allegories of the Orlando, or the Jerusalem Delivered. Such a picture, too, of the darkest tinges of villany, unmitigated by the intermixture

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[1] Dr Burney mentions him in terms of high commendation: "Pro πρόσω legendum monet πρὸ σοῦ Joannes Young, Gr. Ling. Professor in Universitate Glasguæ, vir doctrinæ eximiæ, et mihi propter varias ingenii dotes multos per annos dilectissimus." (Tentamen de Metris ab Æschylo in Choricis Cantibus adhibitis, Sept. c. Theb. p. 84. Cantabrigiæ, 1809, 8vo.)

[2] Bibliotheca Mooriana: sive Catalogus Librorum rarissimorum, præcipue in Græcis ac Latinis Litteris, quorum optimas accuratissimasque Editiones, maximo sumptu nec minori diligentia collegit vir doctissimus, et in his rebus apprime sagax, Jacobus Moor, LL. D. in Acad. Glasguensi Litt. Græc. Prof. Emeritus. Adjectus est alter Catalogus omnium fere Librorum in Græco, Latino, vel Anglico Sermone, jam rarissimorum, quos excudebant Rob. et And. Foulis, Acad. Glasguensis Typographi celeberrimi, nuper defuncti: et quorum elegantium Librorum summus nitor fautoribus pulchrioris typographiæ per totam Europam sese tam egregie commendavit. Omnes Libri (quorum et titulos et pretia continet uterque Catalogus) venales prostant Edinburgi, apud legitimum possessorem Jacobum Spotiswood, in vico dicto *Niddry's Wynd*. Venditione incipiente ab ipsis Id. Feb. A. D. 1779. 8vo.

Moore.

of one good quality, harmonizes so little with the ideas or feelings of this country, that we revolt at its improbability; or, at least, the credence of reality, so essential to the success of every fictitious narrative, is hardly ever excited. Besides, the principal parts of the work are not such as afford scope for the display of the author's peculiar excellencies. The mind, however, is occasionally relieved by scenes of humour and pleasantry, by picturesque sketches, and interesting traits of character. The comic part, indeed, is infinitely superior to the tragic, and in it the author seldom fails. Of Transfer we have, perhaps, too much, but Buchanan is an admirable sketch. There is much light humour in the relation of the story of Rosolia, and the comic dialogue is invariably spirited and lively. Though now somewhat sunk in reputation, Zeluco was much admired on its first appearance, and was hailed as one of those productions which, by its knowledge of human nature, and reach of mind, redeemed the species of composition to which it belonged from the imputation of frivolity, and elevated fictitious narratives to a higher walk in the paths of literature.

In 1792 Dr Moore accompanied Lord Lauderdale to Paris, where he witnessed some of the principal scenes of the Revolution, of which he published an interesting account on his return to England. The same journey supplied him with materials for his View of the Causes and Progress of the French Revolution, which was published in 1795.

The scenes which Dr Moore had hitherto exhibited, both in his travels and fictitious compositions, were copied from the manners of other countries. The novel of Edward, which he published in 1796, is entirely confined to the illustration of our domestic usages and national customs. Edward is a foundling, whom chance places under the protection of Mrs Barnet. Under her guidance his mind, which is intended as a contrast to that of Zeluco, gradually unfolds every amiable and every manly virtue. His character is exhibited in many trying situations, till at length, by a natural series of incidents, he is finally brought to the discovery of his reputable descent, and is united to a beautiful heiress, of whom he was enamoured, and of whom the person he discovers to be his mother is the guardian. The thread, however, by which the hero is connected with the other characters of the work is very slight, and the incidents are barely such as keep up its title to the character of a regular novel. It is not distinguished by originality of sentiment, by novelty of character, by deep involution of events, or by scenes of complicated distress or unexpected deliverance. But, without strongly interesting the feelings, the mind is kept, particularly through the conversation pieces, in an agreeable state of amusement; and it is wonderful that, in its perusal, we should experience so little lassitude, when there is so little excitation.

Mordaunt possesses something of the same sort of merit as Edward, but in an inferior degree. A series of letters from different persons, characteristically supported, was a species of novel which required great versatility of powers, and one in which the genius of Dr Moore qualified him peculiarly to excel. But it would appear that the brilliancy of his wit had been tarnished by too frequent exposure to the world, or that his natural vivacity had been somewhat diminished by the advance of age. He survived the publication of Mordaunt only two years, and died at London in 1802.

The reputation of Dr Moore with posterity will rest on his travels and novels. As long as they are read, he will be acknowledged as a writer endowed with admirable good sense, a rich vein of original humour, an uncommon insight into human nature, and a capacity of describing its intricacies with force and discernment.

MOORE, Sir John, a consummate British general, a fearless soldier, and an accomplished gentleman, was born at Glasgow, on the 13th of November 1761. He was a son of Dr Moore, the author of Zeluco and other works just mentioned, and received the principal part of his education on the Continent, whilst his father attended the Duke of Hamilton in his travels. Of his early years the meagre biography of his brother has supplied us with few particulars, excepting that he was "really a pretty youth," and, in the true spirit of his country, quarrelled with French boys of his own age. In 1776, the Duke of Hamilton procured him an ensigncy in the 51st regiment, then quartered in Minorca; and he afterwards obtained a lieutenancy in the 82d, with which he served in America until 1783, when he was reduced with his regiment. By the interest of the Duke of Hamilton, he was subsequently brought into parliament for the Lanark district of burghs, which he for a short time represented. In 1787 or 1788, he obtained the rank of major in the fourth battalion of the 60th regiment, then quartered at Chatham, but afterwards negociated an exchange into the 51st. In 1790, he succeeded by purchase to the lieutenant-colonelcy of the same regiment, which, the following year, he accompanied to Gibraltar. After some other movements, he was sent to Corsica, where, owing to a misunderstanding between the military and naval commanders, General d'Aubant resigned the command to him under the most critical circumstances; and here, though still a young officer, and without parliamentary friends, he was called to fight the battles of the army against a domineering old admiral, Hood, who possessed great influence at home, and who had shown himself capable of the most outrageous violence, not unaccompanied with subtlety. By dint of firmness, however, he succeeded in controlling this daring, obstinate, clever, headstrong man; and was at length relieved from the difficult and embarrassing situation in which he had been placed, by the arrival of Sir Charles Stuart, who having assumed the command of the army in 1794, appointed Moore to command the reserve. At the siege of Calvi, which followed, the latter particularly distinguished himself, and received his first wound in storming the Mozzello fort. He gave his opinion against besieging Bastia, which afterwards surrendered after a very feeble defence, though the place was strong and the garrison numerous; but this, as a military judgment before the event, was nevertheless sound and just, for Moore never could have anticipated that General Gentili would neglect to avail himself of the means in his power, "because he wished to do his duty and no more," and had property in England.

Sir Charles Stuart having been recalled, in consequence of a disagreement with the viceroy, Colonel Moore returned to England in 1795, and being immediately appointed a brigadier-general in the West Indies, he was attached to a brigade of foreign troops, consisting of Choiseul's hussars, and two corps of emigrants. On the 25th of February 1796, he received orders to take charge of and embark with Perryn's brigade, destined to join the expedition to the West Indies under Sir Ralph Abercromby; and having hurried to Portsmouth, where he had scarcely time to prepare a few necessaries, he sailed for the West Indies at daylight on the 28th, with no other baggage than a small portmanteau. He arrived at Barbadoes on the 13th of April 1796, and there waited on the commander-in-chief, who had preceded him in the Vengeance line-of-battle ship. That calm and sagacious observer soon appreciated his merit, and in the operations against St Lucia, which immediately followed, employed him in every arduous and difficult service. During the siege of Morne Fortunée, his conduct, as expressed in general orders, was the admiration of the whole army; and, after the capitulation, he was appointed to the government of the island, notwithstanding he had earnestly requested permission to accompany the commander-in-chief

Moore.

Moore. and the troops in the reduction of the other islands. In this situation, beset with all manner of difficulties, his conduct was not less admirable than in the field, and, tempering justice with humanity, the severity of military examples with a due consideration of the circumstances which palliated the conduct of the negroes and republicans, he subdued discontent, restored order, and re-established security. He abhorred the cruelty of punishment, and deplored the necessity of it; but whilst he inflicted it reluctantly, he did ample justice to the heroic qualities of the misguided people, whom oppression had rendered desperate. He warred against them, and punished their crimes, but he admired their courage, and he despised, reproached, and restrained the whites, whose tyranny had first sown in the hearts of the unfortunate negroes the seeds of that ferocity which it was his painful duty to repress. From certain published extracts of a journal kept by him, it appears that he had the very worst opinion of the emigrants and proprietors of slaves, whom he speaks of with contempt and indignation; that he deplored the condition of the blacks, and threatened the emigrants with punishment for casting reflections on the submissive republicans; that he checked them for their ill treatment of the negroes, and repeatedly assured the people that royalist or republican would be neither a merit nor a demerit with him; and that he suspected the slave proprietors of wishing for detachments of troops to enable them to tyrannize over the negroes, a system he abhorred and never would sanction. "Why," he exclaimed, "is a man to be treated harshly because he is not white? All men are entitled to justice; and from me they shall have it, whether they be white, black, royalist, or republican." This noble language was not agreeable to the emigrants; but he had no preference for them, and wished to curb their insolence, because, instead of profiting by their misfortunes, they had only whetted their prejudices, and thirsted to gratify their revenge, by oppressing their fellow-creatures. Nor was he at all surprised that so many of the blacks should have hailed the opportunity of gaining their freedom. With the observant and humane spirit which so peculiarly distinguished him, he remarked, "that the West Indies was the only country in the world where industry and cultivation added nothing to the happiness of the people; because all was for the benefit of the few who were white, and nothing went to the comfort of the many who were black."

Having reduced the numerous bands of armed negroes who had taken to the woods, and completely re-established tranquillity in St Lucia, Moore was relieved from the command of the island, and returned to England in August 1797. In November, Sir Ralph Abercromby having received the command of the forces in Ireland, desired that General Moore should be placed on his staff, and the latter accordingly accompanied him to Dublin in the beginning of December. During the period immediately preceding the rebellion, he held an important command in the south of Ireland, which, being much disaffected, was considered as the quarter where the enemy were, in the event of an invasion, likely to attempt a landing. His head-quarters were at Bandon, and the troops under his command, amounting to 3000 men, formed the advanced guard of the south. When the insurrection broke out in 1798, he was at first employed under Major-General Johnstone at New Ross, but was afterwards detached towards Wexford, at that time in the hands of the insurgents. On this occasion he had only the 60th sharpshooters, 500 light infantry, fifty of Hompesch's dragoons, and six pieces of artillery; and with these troops he had not proceeded above a mile when a large body of insurgents appeared on the road, advancing to attack him. The rebels, amounting to about 6000 men, headed by one Roche, attacked with great spirit, and maintained the conflict with much obstinacy, but were at length defeated, driven from the field, and pursued with great loss. After the action he was joined by two regiments from Duncannon, and took post for the night upon the ground where the combat had commenced. Next day, when he had resumed his march, he was met by two men from Wexford, with proposals on the part of the insurgents to lay down their arms and submit on certain conditions; but General Moore, having no power to treat, declined entertaining these proposals, and continued his march to Wexford, which he delivered from the power of the insurgents. He was afterwards employed to suppress a remnant of the rebellion in Wicklow, where many of the insurgents had taken refuge amongst the mountains and bogs, whence they issued to wage a sort of desultory warfare. Speaking of this affair in his journal, he says that "moderate treatment by the generals, and the preventing of the troops from pillaging and molesting the people, would soon restore tranquillity; that the latter would certainly be quiet if the gentlemen and yeomen would only behave with tolerable decency, and not seek to gratify their ill humour and revenge upon the poor;" and he adds, "that he judged their harshness and violence had originally driven the farmers and peasants to revolt, and that they were as ready as ever to renew their former ill usage of them." Moore.

These and other similar observations on the insurrection of 1798, extracted and published from General Moore's journal, do equal honour to his head and heart, evincing the discriminating and unimpassioned sagacity of the statesman, united with that high and liberal feeling which forms the greatest ornament in the character of the accomplished soldier. "In this country," says he, "they quell disturbances by proclaiming districts, and letting the soldiers loose upon the people, and the military are encouraged to violence against all who are called disaffected." Again, "the giving away of militia regiments was managed so as to serve parliamentary purposes, and they were officered in the same view. Thus the most profligate of men are empowered to work any evil that their cupidity or revengeful passions prompt them to; and so complete are the ramifications of corruption, and so complicated the abuses, that the appointment of a dictator seems to be the only cure." When the chancellor Fitzgibbon asserted in a speech he delivered at the time, "that conciliation had already been tried with the Catholics, but that it had only created discontent, and that each new concession produced new demands," General Moore remarked, that "nothing could be more natural in the people, nothing more unreasonable than the chancellor's complaint; that the Catholics had a right to be put on the same footing with their fellow-subjects; that they were pleased with each approach to that equality, but unsatisfied till they obtained all; that the government was impolitic and unjust to favour one part to the oppression of nineteen; and that all to whom equal rights were denied were oppressed." He further expressed his indignation at the treatment of the poor people, and his disapproval of the system of government, which he describes as "having no other object than that of terrifying the poor, ready always to grant any power to act against them, but indulging the rest of the community in every sort of abuse and violence." With a government acting in this spirit, with an army "formidable to every body but the enemy," and with an exasperated faction in the heart of the country to take advantage of the one, and encourage the utmost license of the other, the wonder is not that the oppressed people, when arms were in their hands, should have committed some excesses, but that they did not rise in mass, and by one great simultaneous effort bury their oppressors under the ruins of their own tyranny. The enlightened views, the calm discernment, and the just and humane sentiments of Moore, are honourable to his memory, and worthy of the chief under whom he served, but stand

Moore. in striking contrast to the short-sighted policy, the ferocious prejudices, the blind bigotry, and the inhuman violence, of those by whom he was surrounded, in all departments of the public service.

Immediately after quitting Ireland, General Moore engaged in the memorable expedition to Holland. The result of this enterprise is well known. The Dutch, whom we sought to rescue from the alleged tyranny of the French government, made common cause with the enemy; they received the French as friends and deliverers, because the house of Orange, aided by Prussia, had destroyed their republic, suppressing their constitution and liberties; and hence, after a short struggle, the Duke of York was obliged to capitulate. But the troops displayed their usual gallantry, particularly those under the command of General Moore, who, after being wounded in the hand and thigh, received a musket ball in the face, and was with difficulty brought from the ground. Being carried back to his quarters, a distance of ten miles, he was taken thence to the Helder, as soon as he could be moved, and embarked on board the Amethyst frigate, which arrived at the Nore on the 24th of August. Soon after his return to England, the king conferred on him the command of a second battalion which had just been added to the 52d regiment; and his wounds having closed in the course of five or six weeks, he joined his brigade at Chelmsford on the 24th of December.

Early in 1800, it had been resolved to send a body of troops to the Mediterranean under the command of Sir Charles Stuart; and General Moore willingly consented to serve under that officer, whom he greatly esteemed. The first intention was, that the expedition should consist of 15,000 men; but it afterwards turned out that the regiments destined for the service, part of which had lately been employed in Holland, mustered only 10,000 effective. About the middle of March, the first division, amounting to 5000 men, embarked under General Pigott. But at this time a change took place in the plan, if not in the destination, of the expedition. Sir Charles Stuart, having some misunderstanding with ministers, resigned his command; and Sir Ralph Abercromby being appointed to succeed him, named, as one of his major-generals, Moore, who, along with Pigott and Hutchinson, sailed about the end of April with the second division of the troops. During this expedition, which a variety of causes conspired to render abortive, General Moore had little opportunity of signalizing his exertions; nor was it until the following year, when his troops were ordered to proceed to Egypt under Sir Ralph Abercromby, that a theatre of action opened for the display of his talents. On his arrival at Malta, he was sent forward to Jaffa to inspect the Turkish army, and judge as to the amount of co-operation which might be expected from it; but his report being unfavourable, Sir Ralph determined to land in the bay of Aboukir, and to march immediately upon Alexandria. This was what is familiarly called taking the bull by the horns. In regard to the operations which followed, it is inconsistent with the object of this article to enter into any details respecting them. It is sufficient to mention, that, in the affair of the landing on the 8th of March 1801, in the combat of the 13th, and again in the battle of the 21st, where he received a wound in the leg, General Moore was actively engaged, and, as usual, greatly distinguished himself. On recovering from his wound, which occasioned him much suffering, he continued to serve with the army in Egypt until after the surrender of Alexandria, when he returned to England, where he received the honour of knighthood and the order of the Bath.

It appears from the portion of his journal which has been published, that it contains invaluable materials for a history of the campaign in Egypt. The account of the battle of Alexandria, which his brother, Mr James Moore has had the grace to insert in his book, is in every respect admirable. It is also satisfactory to find him censuring that act of mingled vandalism and cruelty perpetrated by General Hutchinson; we mean the cutting of the dike which excluded the sea from Lake Mareotis, by which the lands of the poor Copts were swallowed up to the extent of about forty miles, without any adequate or compensating military advantage. We should have been still more gratified if his brother had given the fragment which he is stated to have written in defence of Sir Ralph Abercromby's military conduct, which Sir John ably vindicates, in answer to the impudent observations of General Regnier. There seems to be no good reason why this interesting composition should have been withheld, unless, indeed, something of the kind may be detected in the declaration which it contains, that "English expeditions were seldom successful, and always difficult to conduct, because they were conducted by ministers who were ignorant of military affairs, and too arrogant and self-sufficient to consult military men." Moore.

Soon after his return to England, we find Sir John Moore actively occupied in the camp at Shorn-Cliff, where his skill in training troops was proved to be equal to his daring in leading them. Many persons have been led to suppose that he was a harsh and odious disciplinarian; but this calumny has been refuted by the most irrefragable proof. "The officers of the regiments which were formed by his care," says an able writer in the *Edinburgh Review*, supposed to be Colonel Napier, "were ever after his warmest admirers; his discipline it has been their object to maintain; his maxims have been their guide; his reputation has been by them considered as a part of their own; his memory is cherished in their hearts to this day, and will be as long as those hearts retain an atom of a soldier's pride and honour." Such is the testimony of one who knew him thoroughly; and who, besides his pre-eminent qualifications for judging rightly, had the best opportunities of understanding his views and appreciating his real character.

On the renewal of the war, after the short peace of Amiens, Sir John Moore's talents and services pointed him out as deserving of some important employment. He was accordingly sent to Sicily, as second in command to Sir John Stuart; and, when that officer had been superseded by General Fox, he virtually acquired the chief command in that island. His superior in command was too infirm to lead an army in the field, but by no means so debilitated as to be unable to conduct the affairs of Sicily. If his talents were not of a high order, they were at least respectable; and he had the merit of not being above taking the advice of wiser men. He generally agreed with, and always yielded to, Sir John Moore's opinion; and hence the English interests were better supported during his command than they had ever been before. Associated with such a nominal superior, Moore had full scope for the exercise of his ability and sagacity, and, indeed, his whole proceedings showed that his sense and judgment in civil matters were in no degree inferior to his talents in war. But his brother's account of these transactions is little more than a garbled and impotent abstract, divested of every thing interesting or instructive. We look in vain for Moore's graphic account of the Queen of Naples, and the final character which he draws of her, confirmed as it has since been by the testimony of Micichi in his Memoirs. We want more information respecting his disputes with Mr Drummond, and also some notice of the vagaries of Sir Sidney Smith. We desire to learn his sentiments upon the state of Sicily, as to the character and wishes of the people of that island; and nothing could have been more instructive than an exposition of his views respecting a descent upon Italy, which he was pressed to invade, but refused until he could offer the Italians something better

Moore. to fight for than the oppressions and abuses of the Sicilian court. His military criticism upon General Fraser's expedition to Egypt, in the year 1807, might also have found a place in the life of a general, especially one written by a brother; but this, and much more, which would have thrown light on the events of that time, as well as reflected credit on his character and memory, has been most unaccountably withheld.

When Sir John Moore arrived in England from Sicily, he was immediately sent with an expedition to Gottenburg, although for what purpose, except to get him out of the way, whilst troops were sent to Portugal under Sir Arthur Wellesley, it is difficult to conjecture. But however this may be, if the troops had been committed to the charge of a man less able, prompt, and resolute, 10,000 of the finest soldiers of England would have been sacrificed. "The contradictory instructions given by the ministers," says the able writer already referred to, "and the silence observed by them when Moore represented the real state of affairs, were proofs of their bad intentions, and bad faith, as well as absurdity; and if any doubt could be entertained upon this head, the orders which reached Sir James Saumarez, three days after Moore's departure from Gottenburg (orders prescribing the employment of the army to bring off the Spaniards under Romana from Holstein), would have set that doubt aside." This is, no doubt, a strong opinion; but when it is considered, that if the king of Sweden had been only one degree less insane than he actually was, the English ministers would, at the same time, have commenced regular military operations by land against Russia in one extremity of Europe, and Napoleon in the other, it is difficult to account for their conduct upon any principle of sense or rational policy. On his return to England, Sir John Moore was received with something more than coldness by the ministers, who gave him no credit whatever for saving the troops, and seem to have been offended because their designs, whatever these were, had been baffled by his energy and decision.

We come now to the expedition to Spain, which terminated Sir John Moore's earthly career. In 1808, he was appointed to the chief command of an army to be employed in Spain; and Gallicia, or the borders of Leon, were fixed upon as the place for assembling the troops. He was ordered to send the cavalry by land, but it was left to his own discretion to transport the infantry and artillery either by sea or land; and being at the same time informed that 15,000 men were ordered to Coruna under General Sir David Baird, he was directed to give such instructions to that officer as should facilitate the junction of the whole force. Before he commenced his advance from Portugal, he was assured that his entry into Spain would be covered by from 60,000 or 70,000 men; and Burgos was the place fixed on for the junction of the different divisions. But he soon discovered that these assurances were fallacious, that little or no reliance could be placed upon the Spaniards, and that the patriotic enthusiasm which he had been taught to expect in the people had either never existed at all, or had entirely evaporated. Not only Burgos, but Valladolid, was in possession of the enemy; and he found himself with an advanced corps, in an open town, at the distance of only three marches from the French army, without even a Spanish piquet to cover his front. At this time, he had only three brigades of infantry, without a single gun in Salamanca; and although the remainder were coming up in succession, the whole could not be assembled in less than ten days. At this critical moment, the Spanish armies, instead of concentrating or uniting in a common effort with the British, were disseminated all over the peninsula; Blake had been defeated, and his army totally dispersed; Romana, equally weak and obstinate, proved incapable of undertaking any thing; and Sir David Baird, informed that the French were advancing upon him in two directions, was preparing to retreat upon Coruña, a movement which was countermanded by Sir John Moore, upon learning that the report was unfounded. For an account of what followed, we must refer to the first volume of Colonel Napier's History of the Peninsular War. Never was a general commanding an army placed in a more critical position than Sir John Moore; for, whilst he received information that there was now no army remaining in the field except his own, which was thus exposed to be attacked upon all sides by overwhelming numbers, he was called upon to repel the most irritating interference, to guard against open treachery, and to counteract folly, equal in its effects to treachery. Yet, even in these circumstances, he was willing to attempt something for the cause, and even to risk the danger of an advance on the capital. With this view he commenced a forward movement from Salamanca on the 12th of December, intending to attack Soult on the Carrion, draw the mass of the French force towards the north of Spain, and thus afford the Spanish armies time to rally and adopt some new plan of operations. This movement, in a strategical point of view, was ably conceived and well timed, hardy, and successful; but Sir John Moore, with 23,000 men, could not maintain himself against the whole French army; and as Napoleon, having secured the capital, was now rapidly advancing at the head of from 60,000 to 70,000 men, a retreat became inevitable. In what manner this retreat was conducted, and how gloriously it terminated, we shall leave Colonel Napier to describe. Moore.

"Lord Bacon observes, that 'honourable retreats are noways inferior to brave charges, as having less of fortune, more of discipline, and as much of valour.' That is an honourable retreat in which the retiring general loses no trophies in fight, sustains every charge without being broken, and finally, after a severe action, re-embarks his army in the face of a superior enemy without being seriously molested. It would be honourable to effect this before a foe only formidable from numbers, but it is infinitely more creditable, when the commander, while struggling with bad weather and worse fortune, has to oppose veterans with inexperienced troops, and to contend against an antagonist of eminent ability, who scarcely suffers a single advantage to escape him during his long and vigorous pursuit. All this Sir John Moore did, and finished his work by a death as firm and glorious as any that antiquity can boast of.

"Put to Lord Bacon's test, in what shall the retreat to Coruña be found deficient? Something in discipline, perhaps, but that fault does not attach to the general. Those commanders who have been celebrated for making fine retreats were in most instances well acquainted with their armies; and Hannibal, speaking of the elder Scipio, derided him, although a brave and skilful man, for that, being unknown to his own soldiers, he should presume to oppose himself to a general who could call to each man under his command by name: thus inculcating, that, unless troops be trained in the peculiar method of a commander, the latter can scarcely achieve any thing great. Now Sir John Moore had a young army suddenly placed under his guidance; and it was scarcely united when the superior numbers of the enemy forced it to a retrograde movement under very harassing circumstances: he had not time, therefore, to establish a system of discipline; and it is in the leading events, not the minor details, that the just criterion of his merits is to be sought for.

"Was the retreat uncalled for? Was it unnecessarily precipitate? Was any opportunity of crippling the enemy lost? Was any weakness to be discovered in the personal character of the general? These are the questions that sensible men will ask: the first has been already examined; the second is a matter of simple calculation. The rear guard quitted Astorga on the 1st of January; on the

Moore. 3d it repulsed the enemy in a sharp skirmish at Calcabelos; the 6th it rejoined the main body at Lugo, having three times checked the pursuers during the march. It was unbroken, and lost no gun, suffered no misfortune; the whole army offered battle at Lugo for two successive days; it was not accepted; and the retreat recommencing, the troops reached Betanzos on the morning of the 10th, and Coruña on the 11th: thus, in eleven days, three of which were days of rest, a small army passed over a hundred and fifty miles of good road. Now Napoleon, with fifty thousand men, left Madrid on the 22d of December, the 28th he was at Villapando, having performed a march, on bad roads, of a hundred and sixty-four miles in seven days. The retreat to Coruña was consequently not precipitate, unless it can be shown that it was unnecessary to retreat at all beyond Villa Franca; neither can it be asserted that any opportunity of crippling the enemy was lost. To fight a battle was the game of the French marshal; and if any censure will apply to his able campaign, it is that he delayed to attack at Lugo; victorious or beaten, the embarrassments of his adversary must have been increased; Sir John Moore must have continued his retreat encumbered with the wounded, or the latter must have been abandoned without succour in the midst of winter.

"At Coruna the absence of the fleet necessarily brought on a battle. That it was honourable to the British troops is clear from the fact that they embarked without loss after the action; and that it was absolutely necessary to embark notwithstanding the success, is as certain a proof how little advantage could have been derived from any battle fought farther inland, and how prudently Sir John Moore acted in declining an action the moment he had rallied his army at Lugo, and restored that discipline which the previous movements had shaken; but, notwithstanding the clamour with which this campaign has been assailed, as if no army had ever yet suffered such misfortunes, it is certain that the nominal loss was small, the real loss smaller, and that it sinks into nothing when compared with the advantages gained. An army which, after marching in advance or retreat above five hundred miles before an enemy of immensely superior force, has only lost, including those killed in battle, four thousand men, or a sixth part of its numbers, cannot be said to have suffered severely; nor would the loss have been so great, but for the intervention of the accidental occurrences mentioned in the narrative. Night marches are seldom happy; that from Lugo to Betanzos cost the army in stragglers more than double the number of men lost in all the preceding operations; nevertheless, the reserve in that, as in all the other movements, suffered little; and it is a fact, that the light brigades detached by the Vigo road, which were not pursued, made no forced marches, slept under cover, and were well supplied, left, in proportion to their strength, as many men behind as any other part of the army; thus accumulating proof upon proof that inexperience was the primary and principal cause of the disorders which attended the retreat. Those disorders were sufficiently great; but many circumstances contributed to produce an appearance of suffering and disorganization which was not real. The intention of Sir John Moore was to have proceeded to Vigo, in order to restore order before he sailed for England; instead of which, the fleet steered home directly from Coruña; a terrible storm scattered it; many ships were wrecked, and the remainder, driving up the channel, were glad to put into any port. The soldiers, thus thrown on shore, were spread from the Land's End to Dover. Their haggard appearance, ragged clothing, and dirty accoutrements, things common enough in war, struck a people only used to the daintiness of parade, with surprise; the usual exaggerations of men just escaped from perils and distresses were increased by the uncertainty in which all were as to the fate of their comrades; a deadly fever, the result of anxiety, and of the sudden change from fatigue to the confinement of a ship, filled the hospitals at every port with officers and soldiers; and thus the miserable state of Sir John Moore's army became the topic of every letter, and a theme for every country newspaper along the coast. The nation, at that time unused to great operations, forgot that war is not a harmless game, and, judging of the loss positively, instead of comparatively, was thus disposed to believe the calumnies of interested men, who were eager to cast a shade over one of the brightest characters that ever adorned the country. Those calumnies triumphed for a moment; but Moore's last appeal to his country for justice will be successful. Posterity, revering and cherishing his name, will visit such of his odious calumniators as are not too contemptible to be remembered, with a just and severe retribution; for thus it is that time freshens the beauty of virtue and withers the efforts of baseness; and if authority be sought for in a case where reason speaks so plainly, future historians will not fail to remark, that the man whose talents exacted the praises of Soult, of Wellington, and of Napoleon, could be no ordinary soldier. Moore.

"'Sir John Moore,' says the first, 'took every advantage that the country afforded to oppose an active and vigorous resistance, and he finished by dying in a combat that must do credit to his memory.'

"Napoleon more than once affirmed, that if he committed a few trifling errors, they were to be attributed to his peculiar situation, for that his talents and firmness alone had saved the English army from destruction.

"'In Sir John Moore's campaign,' said the Duke of Wellington, 'I can see but one error; when he advanced to Sahagun he should have considered it as a movement of retreat, and sent officers to the rear to mark and prepare the halting-places for every brigade; but this opinion I have formed after long experience of war, and especially of the peculiarities of a Spanish war, which must have been seen to be understood; finally, it is an opinion formed after the event.'"[1]

The fall of Sir John Moore is thus described by Captain, now Sir Henry, Hardinge: "I had been ordered by the commander-in-chief to desire a battalion of the guards to advance; which battalion was at one time intended to have dislodged a corps of the enemy from a house and garden on the opposite side of the valley; and I was pointing out to the general the situation of the battalion, and our horses were touching, at the moment that a cannon-shot from the enemy's battery carried away his left shoulder, and part of the collar-bone, leaving the arm hanging by the flesh. The violence of the stroke threw him off his horse on his back. Not a muscle of his face altered, nor did a sigh betray the least sensation of pain. I dismounted, and, taking his hand, he pressed mine forcibly, casting his eyes anxiously towards the 42d regiment, which was hotly engaged; and his countenance expressed satisfaction when I informed him that the regiment was advancing. Assisted by a soldier of the 42d, he was removed a few yards behind the shelter of a wall. Colonel Graham of Balgowan (Lord Lyndoch) and Captain (now Sir John) Woodford, about this time came up, and, perceiving the state of Sir John's wound, instantly rode off for a surgeon. The blood flowed fast, but the attempt to stop it with my sash was useless, from the size of the wound. Sir John assented to being removed in a blanket to the rear. In raising him for that purpose, his sword, hanging on the

[1] Napier's History of the War in the Peninsula, vol. i. p. 525–530.

Moorghur || Moorshedabad.

wounded side, touched his arm, and became entangled between his legs. I perceived the inconvenience, and was in the act of unbuckling it from his waist, when he said, in his usual tone and manner, and in a very distinct voice, 'It is as well as it is; I had rather it should go out of the field with me.'" When the surgeons arrived, he said to them, "you can be of no service to me; go to the soldiers, to whom you may be useful." As he was carried slowly along in the blanket, he made the soldiers by whom he was borne frequently turn him round to view the field of battle, and listen to the firing, and he seemed pleased when the sound grew fainter. On arriving at his lodgings, he suffered great pain, and could speak but little; at length, however, he said to Colonel Anderson, who, for more than twenty years, had been his friend and companion in arms, "Anderson, you know that I always wished to die in this way." He frequently asked, "Are the French beaten?" and when he was told that they had been defeated at every point, he said, "It is a great satisfaction for me to know that we have beaten the French;" adding, "I hope the people of England will be satisfied; I hope my country will do me justice." To Major Stanhope he said, "Stanhope, remember me to your sister;" and having mentioned the name of his venerable mother, for whom he seemed anxious to offer up his last prayers, he lost all power of utterance, and in a few minutes afterwards expired without a struggle.

Thus fell, on the 16th of January 1809, in the forty-seventh year of his age, after gaining a victory which saved the remainder of the army from destruction, and which, in all its circumstances, was perhaps unparalleled in the annals of war, Lieutenant-general Sir John Moore, a perfect model of a British soldier at a time when such models were few, and a hero cast in the true classical mould, being equally a stranger to fear and reproach, yet one whom the rancorous malignity of faction basely attempted to deprive of his just fame, whilst venal pens were hired to depreciate his achievements, and servile poets vainly sought to exclude his name from the list of the brave who had fought and fallen in the same struggle. But his country was well disposed to acknowledge his merits, and history has already placed his character and actions beyond the reach of ever being affected by contemporary injustice. (A.)

MOORGHUR, a formidable town of Hindustan, in the province of Bejapoor, enclosed by a wall, and surrounded by a ditch. It is fifteen miles north-west from Darwar.

MOORING, the act of confining and securing a ship in a particular station, by means of chains or cables, which are fastened either to the adjacent shore or to anchors in the bottom.

MOORLEY, a town of Hindustan, in the province of Bengal, and district of Jessore, sixty-two miles north-east from Calcutta. Long. 89. 15. E. Lat. 23. 7. N.

MOORLEYDURSERAY, a town of Hindustan, in the province of Agra, district of Etaweh, forty-two miles east-south-east from the city of Agra. Long. 78. 40. E. Lat. 27. 1. N.

MOORSHEDABAD, a city of Hindustan, in the district of Ranjeshy, and province of Bengal, of which it was at one time the capital. Its original name was Muksoosabad; but this was changed to its present denomination. It extends, including Cossimbazar, eight miles on both sides of the Bhagiratty or Cossimbazar River, a branch of the Ganges, about 120 miles above Calcutta. It is a modern city, and was never fortified, excepting by an occasional rampart, in 1742, during the Mahratta invasion. The streets are narrow and inconvenient, insomuch that they are impassable for European carriages. The buildings are in general bad. Most of the houses have only one story, with tiled roofs; and the palace of the nabob is so insignificant as to be passed without observation. From the market-place runs a long narrow winding street, composed of mean houses and huts, which is again intersected by others still more narrow and miserable. The sewers originally intended to carry off the water, having been destroyed, the streets become nearly impassable after a heavy fall of rain, and emit putrid effluvia. In the year 1813, a canal was dug between the Bhagiratty and the great Ganges rivers, which, independently of its commercial benefits, tended to ameliorate the unhealthiness of the town. But notwithstanding these exertions, it was remarkably unhealthy in 1814, and many Europeans suffered in the general mortality which prevailed. Various causes are assigned for the unhealthiness of Moorshedabad, in consequence of which the population is on the decline. It is still, however, a place of great inland traffic, and the river is constantly covered with boats. The district of Moorshedabad comprises a portion of territory in the immediate vicinity of the city, and contains, according to estimate, 1,020,572 persons. This district is the chief seat of the manufacture of woven silk and taffeta, both plain and flowered; and many other sorts for inland commerce and exportation are made more abundantly than at any other place where silk is woven. In 1757 Moorshedabad was superseded as the capital of Bengal by Calcutta. Long. 88. 15. E. Lat. 27. 1. N.

Moot || Moradabad.

MOOT, a difficult case argued by the young barristers and students at the inns of court, by way of exercise, the better to qualify them for practice, and for defending the causes of their clients. This is called *mooting*, and forms the chief exercise of the inns of court. Particular times are appointed for the arguing of moot cases. The place where this exercise is performed was anciently called *moot-hall*; and there is a bailiff or surveyor of the moots, annually chosen by the bench, with power to appoint the moot men for the Inns of Chancery, and to keep an account of the performance of exercises. The word is formed either from the Saxon *metan*, *gemetan*, meeting, or from the French *mot*, a word.

MOOTAPILLY, a town of Hindustan, in Guntoor circar, on the coast of Coromandel, situated at the mouth of a river which falls into the Bay of Bengal. Long. 80. 10. E. Lat. 15. 35. N.

MOPSUS, in fabulous history, a celebrated prophet during the Trojan war, the son of Manto and Apollo. He was consulted by Amphimachus, king of Colophon, who wished to know what success would attend his arms in a war which he was going to undertake; and he predicted the greatest calamities; but Calchas, who had been a soothsayer of the Greeks during the Trojan war, promised the greatest successes. Amphimachus followed the opinion of Calchas; but the prediction of Mopsus was fully verified. This had such an effect upon Calchas, that he died soon afterwards. His death is attributed by some to another mortification of the same nature.

MORAD, one of the head streams of the Euphrates, and the most considerable of the whole, which has its source under the walls of Bayazed, in about 38. 40. north latitude, and 43. 30. east longitude. It flows westward, and joins the northern branch near Kebban, in Mount Taurus. The valley through which this river runs yields the finest pasturage in the world. It is now abandoned to the wandering tribes.

MORADABAD, a town of Hindustan, in the province of Delhi, district of Bareilly. It has considerably declined from its ancient consequence, having been the seat of a mint, in which rupees were coined, which are still current in Hindustan. It is fifty miles north-west from the town of Bareilly. This is also the name of a town belonging to Sindia, in the province of Ajmeer, forty miles from the city of that name.

MORAL PHILOSOPHY.[1]

Moral Philosophy.

MORAL PHILOSOPHY is the science of *manners* or *duty*, which it traces from man's nature and condition, and shows to terminate in his happiness; in other words, it is the knowledge of our *duty* and *felicity*, or the art of being *virtuous* and *happy*.

It is denominated an art, as it contains a system of rules for becoming virtuous and happy; and whoever practises these rules, attains an habitual power or facility of becoming virtuous and happy. It is likewise called a science, as it deduces those rules from the principles and connections of our nature, and proves that the observance of them is productive of our happiness. It is an art and a science of the highest dignity, importance, and use. Its object is man's duty, or his conduct in the several moral capacities and connections which he sustains. Its office is to direct our conduct; to show whence our obligations arise, and where they terminate. Its use, or end, is the attainment of happiness; and the means it employs are rules for the right conduct of our moral powers.

Moral Philosophy.

Moral Philosophy has this in common with Natural Philosophy, that it appeals to nature or fact; it depends on observation, and it builds its reasonings on plain uncontrovertible experiments, or upon the fullest induction of particulars of which the subject will admit. We must observe, in both these sciences, how nature is affected, and what her conduct is in such and such circumstances. In other words, we must collect the appearances of nature in any given instance; trace them to some general principles or laws of operation; and then apply these principles or laws to the explanation of other phenomena.

The history of this branch of Philosophy having been largely discussed in the Preliminary Dissertations, we shall here proceed to consider it in a systematic form.

PART I.

CHAP. I.—OF MAN AND HIS CONNECTIONS.

Man's infant state.

Man is born a weak, helpless, delicate creature, unprovided with food, clothing, and whatever else is necessary for subsistence or defence. And yet, exposed as the infant is to numberless wants and dangers, he is utterly incapable of supplying the one, or securing himself against the other. But, though thus feeble and exposed, he finds immediate and sure resources in the affection and care of his parents, who refuse no labours, and forego no dangers, to nurse and rear up the tender babe. By these powerful instincts, as by some mighty chain, does nature link the parent to the child, and form the strongest moral connection on his part, before the child has the least apprehension of its nature. Hunger and thirst, with all the sensations which accompany or are connected with them, explain themselves by a language strongly expressive, and irresistibly moving. As the several senses furnish notices and informations of surrounding objects, we may perceive in the young spectator early signs of a growing wonder and admiration. Bright objects and striking sounds are beheld and heard with a sort of commotion and surprise. But, without resting on any, he eagerly passes on from object to object, still pleased with whatever is newest. Thus the love of novelty is formed, and the passion of wonder kept awake. By degrees he becomes acquainted with the most familiar objects, his parents, his brethren, and those of the family who are most conversant with him. He contracts a fondness for them, is uneasy when they are gone, and charmed to see them again. These feelings become the foundation of a moral attachment on his side; and by this reciprocal sympathy he forms the domestic alliance with his parents, brethren, and other members of the family. Hence he becomes interested in their concerns, and feels joy or grief, hope or fear, on their account, as well as his own. As his affections now point beyond himself to others, he is denominated a good or ill creature, as he stands well or ill affected towards them. These, then, are the first links of the moral chain; the early rudiments, or outlines, of his character, and his first rude essays towards agency, freedom, manhood.

His childhood.

When he begins to make excursions from the nursery, and extends his acquaintance abroad, he forms a little circle of companions, engages with them in play, or in quest of adventures; and leads, or is led by them, as his genius is more or less aspiring. Although this is properly the season in which appetite and passion have the ascendant, yet his imagination and intellectual powers open apace; and as the various images of things pass before the mental eye, he forms variety of tastes, relishes some things, and dislikes others, as his parents and companions, whilst a thousand other circumstances lead him to combine agreeable or disagreeable sets of ideas, or represent to him objects in alluring or odious lights.

As his views are enlarged, his active and social powers expand themselves in proportion; the love of action, of imitation, and of praise; emulation, curiosity, docility, a passion for command, and fondness of change. His passions are quick, variable, and pliant to every impression; his attachments and disgusts quickly succeed each other. He compares things, distinguishes actions, judges of characters, and loves or hates them, as they appear well or ill affected to himself, or to those he holds dear. Meanwhile he soon grows sensible of the consequences of his own actions, as they attract applause, or bring contempt; he triumphs in the former, and is ashamed of the latter, wants to hide them, and blushes when they are discovered. By means of these powers he becomes a fit subject of culture, the moral tie is drawn closer, he feels that he is accountable for his conduct to others as well as to himself, and thus is gradually ripening for society and action.

His youth.

As man advances from childhood to youth, his passions as well as perceptions take a more extensive range. New senses of pleasure invite him to new pursuits; he grows sensible to the attractions of beauty, feels a peculiar sympathy with the sex, and forms a more tender kind of attachment than he has yet experienced. This becomes the cement of a new moral relation, and gives a softer turn to his

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[1] This Treatise seems to have been compiled for the *second* edition of the Encyclopædia Britannica; and, with the addition of a short preliminary view of the History of Ethics, which it received in the third, it has been reprinted in all the subsequent editions. To have republished this historical portion, after the extensive dissertation on the same subject, prefixed to the present edition, would have been worse than useless; but, though that dissertation touches upon almost all the principal doctrines of Ethics, it seemed advisable to reprint the rest; because a sample, at least, of Systematic Ethics, was evidently required in a work of this kind, and the present treatise may be useful in that view, though not in all respects what we could have wished to offer to our readers.

Man and his Connections.

passions and behaviour. In this turbulent period he enters more deeply into a relish of friendship, company, exercises, and diversions; the love of truth, of imitation, and of design, grows upon him; and as his connections spread amongst his neighbours, fellow-citizens, and countrymen, his thirst of praise, emulation, and social affections grows more intense and active. Meanwhile, it is impossible for him to have lived thus long without having become sensible of those more august impressions of order, wisdom, and goodness, which are stamped on the visible creation, and of those strong suggestions within himself of a parent mind, the source of all intelligence and beauty; an object as well as source of that activity and those aspirations which sometimes rouse his inmost frame, and carry him out of himself to an almighty and all-governing power. Hence arise those sentiments of reverence, and those affections of gratitude, resignation, and love, which link the soul with the Author of Nature, and form that most sublime and godlike of all connections.

His manhood.

Man having now reached his prime, either new passions succeed, or the former set are wound up to a higher pitch. For, growing more sensible of his connections with the public, and that particular community to which he more immediately belongs, and taking withal a larger prospect of human life, and its various wants and enjoyments, he forms more intimate friendships, grasps at power, courts honour, lays down cooler plans of interest, and becomes more attentive to the concerns of society; he enters into family connections, and indulges those charities which arise therefrom. The reigning passions of this period powerfully prompt him to provide for the decays of life; whilst compassion and gratitude exert their influence in urging the man, now in full vigour, to requite the affection and care of his parents, by supplying their wants and alleviating their infirmities.

His old age.

At length human life verges downwards, and old age creeps on apace, with its anxiety, love of ease, interestedness, fearfulness, foresight, and love of offspring. The experience of the aged is formed to direct, and their coolness to temper, the heat of youth; the former teaches them to look back on past follies, and the latter to look forward into the consequences of things, and provide against the worst. Thus every age has its peculiar genius and set of passions corresponding to that period, and most conducive to the prosperity of the rest; and thus are the wants of one period supplied by the capacities of another, and the weaknesses of one age tally with the passions of another.

Passions of every age.

Besides these, there are other passions and affections of a less ambulatory nature, not peculiar to one period, but belonging to every age, and acting more or less in every breast throughout life. Such are self-love, benevolence, love of life, honour, shame, hope, fear, desire, aversion, joy, sorrow, anger, and the like. The two first are affections of a cooler strain; one pointing to the good of the individual, the other to that of the species: joy and sorrow, hope and fear, seem to be only modifications, or different exertions, of the same original affections of love and hatred, desire and aversion, arising from the different circumstances or position of the object desired or abhorred, as it is present or absent. From these likewise arise other secondary or occasional passions, which, as far as regards their existence and several degrees, depend upon the original affections being gratified or disappointed; as anger, complacence, confidence, jealousy, love, hatred, dejection, exultation, contentment, disgust, which do not form leading passions, but rather hold of them.

The joint effects of them.

By these simple but powerful springs, whether periodical or fixed, the life of man, weak and indigent as he is, is preserved and secured, and the creature is prompted to a constant round of action, even to supply his own numerous and ever-returning wants, and to guard against the various dangers and evils to which he is obnoxious. By these links men are connected with each other, formed into families, drawn into particular communities, and all united as if by a common league into one system or body, the members of which feel and sympathise one with another. By this admirable adjustment of the constitution of man to his actual state, and the gradual evolution of his powers, order is maintained, society upheld, and human life filled with that variety of passion and action which at once enlivens and diversifies it.

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The directing power.

This is a short sketch of the principal movements of the human mind. Yet these movements are not the whole of man; they impel to action, but do not direct it; they need a regulator to guide their motions, to measure and apply their forces; and accordingly they have one which naturally superintends and directs their action. We are conscious of a principle within us, which examines, and compares, and weighs things; notes the differences, observes the forces, and foresees the consequences, of affections and actions. By this power we look back on past times, and forward into futurity; gather experiences; estimate the real and comparative value of objects; lay out schemes; contrive means to execute them; and settle the whole order and economy of life. This power we commonly distinguish by the name of *reason* or *reflection*, the business of which is not to suggest any original notices or sensations, but to canvass, range, and make deductions from them.

Powers of judging or approving.

We are also intimately conscious of a principle within us, which approves of certain sentiments, passions, and actions, and disapproves of their contraries. In consequence of the decisions of this inward judge, we denominate some actions and principles of conduct right, honest, good; and others wrong, dishonest, evil. The former of these excite our esteem, moral complacence, and affection, immediately and originally of themselves, without regard to their consequences, and whether they affect our interest or not; and the latter do as naturally and necessarily call forth our contempt, scorn, and aversion. That power by which we perceive this difference in affections and actions, and feel a consequent relish or dislike, is commonly called *conscience*, or the *moral sense*.

Conscience.

That there is such a power as this in the mind of every man of sound understanding, is a fact which cannot be controverted; but whether it be an instinctive power, or the result of early and deep-rooted associations, has been long and ably debated. The question is of importance in the science of human nature, as well as in ascertaining the standard of practical virtue; but to us it appears that the contending parties have carried their respective opinions to dangerous extremes.

When it is affirmed, as it sometimes has been, that reason has nothing to do in ethical science, but that in every possible situation our duty is pointed out and the performance of it enforced by mere sentiment, the consequence seems to be, that virtue and vice are nothing permanent in themselves, but change their nature according to local circumstances. Certain it is, that sentiment has in similar situations approved of very different practices in different ages and different nations. At present this sentiment in Europe approves of the universal practice of justice, and of parents protecting their children, whether well or ill formed, whether strong or weak; but in Sparta we know that theft, if dexterously practised, was approved, and not unfrequently rewarded; and that the exposition of lame and deformed children was not only permitted, but absolutely enjoined. There is nothing which our conscience or moral sense condemns with greater severity, or views as a crime of a deeper dye, than the unkind treatment by children of their aged parents; yet there are savages, amongst whom instincts of all kinds ought to prevail in greater purity than in civilized nations, whose moral sense permits them to put their aged and decrepid parents to

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death. If this sense be instinctive, and the sole judge of right and wrong, how comes it to decide so differently on the same line of conduct in different ages and in distant countries? The instinct of brutes, in similar circumstances, prompts uniformly to similar actions in every age and in every region where the species is found; and the external senses of man afford in all nations the same unvaried evidence concerning their respective objects. To these observations we may add, that instincts must be calculated for the state of nature, whatever that state may be, and therefore cannot be supposed capable of directing our steps throughout all the labyrinths of polished society, in which duties are to be performed which in a state of nature would never have been thought of.

But although for these reasons it is apparent that mere sentiment, whether called conscience or the moral sense, would alone be a very unsafe guide to virtue in every individual case that may occur, we think that those who resolve all such sentiment into habit and the effect of education, without giving any part of it to nature, advance an opinion which is equally ill founded and not less dangerous. There are, indeed, men who affirm that all benevolence is hypocrisy, friendship a cheat, public spirit a farce, fidelity a snare to procure trust and confidence; and that whilst all of us at bottom pursue only our private interest, we wear those fair disguises in order to put those off their guard with whom we have to deal, and to expose them the more to our wiles and machinations. Others, again, too virtuous to accuse themselves and the rest of mankind of direct knavery, yet insist, that whatever affection one may feel, or imagine he feels, for others, no passion is or can be disinterested; that the most generous friendship, however sincere, is only a modification of self-love; and that, even unknown to ourselves, we seek our own gratification, whilst we appear the most deeply engaged in schemes for the liberty and the happiness of mankind.

Surely the mildest of these representations is an exaggerated picture of the selfishness of man. Self-love is indeed a very powerful as well as an essential principle in human nature; but that we have likewise an instinctive principle of benevolence, which, without any particular regard to our own interest, makes us feel pleasure in the happiness of other men, is a fact which we think admits of very complete proof. For, as Mr Hume well argues, "when a man grieves for a friend who could be of no service to him, but, on the contrary, stood in need of his constant patronage and protection, how is it possible to suppose that such passionate tenderness arises from self-interest, which has no foundation in nature? What interest," asks the same profound thinker, "can a fond mother have in view, who loses her health by her assiduous attendance on her sick child, and afterwards languishes and dies of grief when freed by its death from the slavery of attendance? Have we no satisfaction," continues he, "in one man's company above another's, and no desire of the welfare of our friend, even though absence or death should prevent us from all participation in it? Or what is it commonly that gives us any participation in it, even while alive and present, but our affection and regard to him?" Nor is it to contemporaries and individuals alone, that, independently of all interest, we feel a benevolent attachment. We constantly bestow praise upon actions calculated to promote the good of mankind, though performed in ages very distant and in countries the most remote; and he who was the author of such actions is the object of our esteem and affection. There is not perhaps a man alive, however selfish in his disposition, who does not applaud the sentiment of that emperor who, recollecting at supper that he had done nothing in that day for any one, exclaimed with regret, that the day had been lost; yet the utmost subtilty of imagination can discover no appearance of interest that we can have in the generosity of Titus, or find any connection of our present happiness with a character removed so far from us both in time and in place. But, as Mr Hume justly observes, if we even feign a character consisting of all the most generous and beneficent qualities, and give instances in which these display themselves, after an eminent and most extraordinary manner, for the good of mankind, we shall instantly engage the esteem and approbation of all our audience, who will never so much as inquire in what age or country the accomplished person lived.

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These are facts which cannot be controverted; and they are wholly unaccountable, if there be not in human nature an instinctive sentiment of benevolence or sympathy which feels a disinterested pleasure in the happiness of mankind. But an end in which we feel such pleasure we are naturally prompted to pursue; and therefore the same sentiment impels every man, with greater or less force, to promote the happiness of other men, which by means of it becomes in reality his own good, and is afterwards pursued from the combined motives of benevolence and self-enjoyment. For in obeying this sentiment we all feel an inward complacency, self-approbation, or consciousness of worth or merit; and in disobeying it, which cannot be done but with reluctance, we feel remorse, or a consciousness of unworthiness or demerit. It appears, however, from history, that the sentiment, as it is instinctive, points only to the good of mankind, without informing us how that good is to be promoted. The means proper for this purpose must be discovered by reason; and when they are brought into view, the sentiment called conscience or moral sense instantly shows us that it is our duty to pursue them.

Hence we see how different lines of conduct may in similar circumstances be approved of as virtuous in different nations. When the Spartan exposed his sickly and deformed child, and when the savage put his aged parents to death, neither the one nor the other erred from want of sentiment, or from having sentiments originally different from ours. Their errors resulted from a defect in reasoning. They both imagined that they were obeying the law of benevolence by preventing misery; for a weak and deformed person was very ill qualified to exist with any degree of comfort under the military constitution of Sparta, where all were soldiers, and under the necessity of enduring the greatest hardships; and in a state where the people have no fixed habitations, and where the precarious chase supplies the necessaries of life, an aged and infirm person is in danger of perishing through hunger, by one of the most cruel and lingering of deaths. The theft allowed in Sparta, if theft it may be called, was still less a deviation from the instinctive law of benevolence. Boys were taught to slip as cunningly as they could into the gardens and public halls, in order to steal away herbs or meat; and if they were caught in the fact, they were punished for their want of dexterity. This kind of theft, since it was authorized by the law and the consent of the citizens, was no robbery; and the intention of the legislator in allowing it, was to inspire the Spartan youth, who were all designed for war, with the greater boldness, subtlety, and address; to inure them betimes to the life of a soldier; and to teach them to shift for themselves, and to live upon little. That the Spartan legislator did wrong in giving his countrymen a constitution, of which successful war was the ultimate object; and that savages, rather than kill their aged parents, or suffer them to die of hunger, ought to cultivate the ground, and abandon the chase, is readily granted; but the faults of the one as well as of the other arose not from any improper decision of the moral sense, but from a defect in their reasoning powers, which were not able to estimate the advantages and disadvantages of different modes of life. In moral decisions, therefore, conscience and reason mutually aid each other. The former principle, when

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separated from the latter, is defective, enjoining only the good of mankind, but unable to point out the means by which it can be most effectually promoted; and the latter principle, when separated from the former, only directs a man to do what is most prudent, but cannot give him a conception of duty.

These two powers of reason and conscience, then, are evidently principles different in nature and kind from the passions and affections. For the passions are mere force or power, blind impulses acting violently and without choice, and ultimately tending each to their respective objects, without regard to the interest of the others, or of the whole system. Whereas the directing and judging powers distinguish and ascertain the different forces, mutual proportions and relations, which the passions bear to each other, and to the whole, recognise their several degrees of merit, and judge of the whole temper and conduct, as they respect either the individual or the species, and are capable of directing or restraining the blind impulses of passion in a due consistency one with the other, and a regular subordination to the whole system.

Division of the passions.

This is some account of the constituent principles of our nature, which, according to their different mixtures, degrees, and proportions, mould our character and sway our conduct in life. In reviewing that large train of affections which fills up the different stages of human life, we perceive this obvious distinction amongst them, that some of them respect the good of the individual, and others carry us beyond ourselves to promote the good of the species or kind. The former have therefore been called *private*, and the latter *public* affections. Of the former sort are love of life, of pleasure, of power, and the like. Of the latter are compassion, gratitude, friendship, natural affection, and the like. Of the private passions, some respect merely the security and defence of the creature, such as resentment and fear; whereas others aim at some positive advantage or good, as wealth, ease, and fame. The former sort, therefore, because of this difference of objects, may be termed defensive passions; they answer to our dangers, and prompt us to avoid them if we can, or boldly to encounter them when we cannot.

The other class of private passions, which pursue private and positive good, may be called *appetitive;* but we shall, nevertheless, retain the name of private in contradistinction to the defensive passions. Man has a great variety of wants to supply, and is capable of many enjoyments, according to the several periods of his life, and the different situations in which he is placed. To these, therefore, correspond a suitable train of private passions, which engage him in the pursuit of whatever is necessary for his subsistence or welfare.

Our public or social affections are adapted to the several social connections and relations which we bear to others, by making us sensible of their dangers, and interesting us in their wants, and so prompting us to secure them against the one and to supply the other.

This is the first step, then, to discover the duty and destination of man; the having analysed the principles of which he is composed. It is necessary, in the next place, to consider in what order, proportion, and measure, of those inward principles, virtue, or a sound moral temper and right conduct, consists, that we may discover whence moral obligation arises.

CHAP. II.—OF DUTY, OR MORAL OBLIGATION.

The measure of powers.

It is by the end or the design of any power or movement that we must direct its motions, and estimate the degree of force necessary to its just action. If it want the force requisite for the obtaining of its end, we reckon it defective; if it has too much, so as to be carried beyond it, we say it is overcharged; and in either case it is imperfect and ill contrived. If it has just enough to reach the scope aimed at, we esteem it right and as it should be. Let us apply this reasoning to the passions.

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Measure of the defensive passions.

The defence and security of the individual being the great aim of the defensive passions, that security and defence must be the measure of their strength or indulgence. If they are so weak as to prove insufficient for that end, or if they carry us beyond it, that is, raise unnecessary commotions, or continue longer than is needful, they are unfit to answer their original design, and therefore are in an unsound and unnatural state. The exercise of fear or of resentment has nothing desirable in it, nor can we give way to either without painful sensations. Without a certain degree of them, we remain naked and exposed; with too high a proportion of them, we are miserable, and often injurious to others. Thus cowardice or timidity, which is the excess of fear, instead of saving us amidst danger, gives it too formidable an appearance, makes us incapable of attending to the best means of preservation, and disarms us of courage, our natural armour. Foolhardiness, which is the want of a due measure of fear, leads us heedlessly into danger, and lulls us into a pernicious security. Revenge, or excessive resentment, by the violence of its commotion, robs us of that presence of mind which is often the best safeguard against injury, and inclines us to pursue the aggressor with more severity than self-defence requires. Pusillanimity, or the want of a just indignation against wrong, leaves us quite unguarded, and tends to sink the mind into a passive enervated tameness. Therefore, to keep the defensive passions duly proportioned to our dangers, is their natural pitch and tenor.

Measure of the private passions.

The private passions naturally lead us to pursue some positive species of private good; that good, therefore, which is the object and end of each, must be the measure of their respective force, and direct their operation. If they are too weak or sluggish to engage us in the pursuit of their several objects, they are evidently deficient; but if they defeat their end by their impetuosity, then are they strained beyond the just tone of nature. Thus vanity, or an excessive passion for applause, betrays us into such meannesses and little arts of popularity, as make us forfeit the honour which we so anxiously court. On the other hand, a total indifference about the esteem of mankind removes a strong guard and spur to virtue, and lays the mind open to the most abandoned prostitutions. Therefore, to keep our private passions and desires proportioned to our wants, is the just measure and pitch of this class of affections.

Comparative force.

The defensive and private passions do all agree in general, in their tendency or conduciveness to the interest or the good of the individual. Therefore, when there is a collision of interest, as may sometimes happen, that aggregate of good or happiness which is composed of the particular goods to which they respectively tend, must be the common standard by which their comparative degrees of strength are to be measured; that is to say, if any of them, in the degree in which they prevail, are incompatible with the greatest aggregate of good or most extensive interest of the individual, then are they unequal and disproportionate. For in judging of a particular system or constitution of powers, we call that the supreme or principal end, in which the aims of the several parts or powers coincide, and to which they are subordinate; and reckon them in due proportion to each other, and right with regard to the whole, when they maintain that subordination of subserviency. Therefore, to proportion our defensive and private passions in such measure to our dangers and wants as best to secure the individual, and obtain the greatest aggregate of private good or happiness, is their just balance or comparative standard in case of competition.

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In like manner, as the public or social affections point at the good of others, that good must be the measure of their force. When a particular social affection, as gratitude, or friendship, which belongs to a particular social connection, as that of a benefactor, or of a friend, is too feeble to make us act the grateful or friendly part, that affection, being insufficient to answer its end, is defective and unsound. If, on the other hand, a particular passion of this class counteract or defeat the interest it is designed to promote, by its violence or disproportion, then is that passion excessive and irregular. Thus natural affection, if it degenerate into a passionate fondness, not only hinders the parents from judging coolly of the interest of their offspring, but often leads them into a most partial and pernicious indulgence.

Measure of the public affections.

Collision of social affections.

As every kind affection points at the good of its particular object, it is possible there may sometimes be a collision of interests or goods. Thus the regard due to a friend may interfere with that which we owe to a community. In such a competition of interests, it is evident that the greatest is to be chosen; and that is the greatest interest which contains the greatest sum or aggregate of public good, greatest in quantity as well as in duration. This, then, is the common standard by which the respective forces and subordinations of the social affections must be adjusted. Therefore we conclude that this class of affections are sound and regular when they prompt us to pursue the interest of individuals in an entire consistency with the public good; or, in other words, when they are duly proportioned to the dangers and wants of others, and to the various relations in which we stand to individuals or to society.

Thus we have found, by an induction of particulars, the natural pitch or tenor of the different orders of affection, considered apart by themselves. Now, as the virtue or perfection of every creature lies in following its nature, or in acting suitably to the just proportion and harmony of its several powers, therefore the *virtue* of a creature endowed with such affections as man must consist in observing or acting agreeably to their natural pitch and tenor.

Balance of affection.

But as there are no independent affections in the fabric of the mind, no passion that stands by itself without some relation to the rest, we cannot pronounce of any one, considered apart, that it is either too strong or too weak. Its strength and just proportion must be measured not only by its subserviency to its own immediate end, but by the respect it bears to the whole system of affections. Therefore we say a passion is too strong, not only when it defeats its own end, but when it impairs the force of other passions, which are equally necessary to form a temper of mind suited to a certain economy or state; and too weak, not merely on account of its insufficiency to answer its end, but because it cannot sustain its part or office in the balance of the whole system. Thus the love of life may be too strong when it takes from the regard due to one's country, and will not allow one bravely to encounter dangers, or even death, on its account. Again, the love of fame may be too weak when it throws down the fences which render virtue more secure, or weakens the incentives which make it more active and public spirited.

Limits of private affections.

If it be asked, how far may the affections towards private good or happiness be indulged? One limit was before fixed for the particular indulgence of each, namely, their subordination to the common aggregate of good to the private system. In these, therefore, a due regard is always supposed to be had to health, reputation, fortune, the freedom of action, the unimpaired exercise of reason, and the calm enjoyment of one's self, which are all private goods. Another limit now results from the balance of affection just named, namely, the security and happiness of others; or, to express it more generally, a private affection may be safely indulged, when, by that indulgence, we do not violate the obligations which result from our higher relations or public connections. A just respect, therefore, being had to these boundaries which nature has fixed in the breast of every man, what should limit our pursuits of private happiness? Is nature sullen and penurious? or, does the God of nature envy the happiness of his offspring?

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Collision of interests.

Whether there is ever a real collision of interests between the public and private system of affections, or the ends which each class has in view, will be afterwards considered; but where there is no collision, there is little or no danger of carrying either, but especially the public affections, to excess, provided both kinds are kept subordinate to a discreet and cool self-love, and to a calm and universal benevolence, principles which stand as guards at the head of each system.

This, then, is the conduct of the passions, considered as particular and separate forces, carrying us out to their respective ends; and this is their balance or economy, considered as compound powers, or powers mutually related, acting in conjunction towards a common end, and consequently as forming a system or whole.

Subordination of powers.

Now, whatever adjusts or maintains this balance, whatever in the human constitution is formed for directing the passions so as to keep them from defeating their own end or interfering with each other, must be a principle of a superior nature to them, and ought to direct their measures and govern their proportions. But it was found that reason or reflection is such a principle, which points out the tendency of our passions, weighs their influence upon private and public happiness, and shows the best means of attaining either. It having been likewise found that there is another directing or controlling principle, denominated *conscience* or the *moral sense*, which, by a native kind of authority, judges of affections and actions, pronouncing some just and good, and others unjust and evil; it follows that the passions, which are mere impulse or blind forces, are principles inferior and subordinate to this judging faculty. Therefore, if we would follow the order of nature, that is, observe the mutual respects and the subordination which the different parts of the human constitution bear one to another, the passions ought to be subjected to the direction and authority of the leading or controlling principles. We conclude, therefore, from this induction, that the constitution or just economy of human nature consists in a regular subordination of the passions and affections to the authority of conscience and the direction of reason.

Economy of nature.

That subordination is regular, when the proportion formerly mentioned is maintained; that is to say, when the defensive passions are kept proportioned to our dangers; when the private passions are proportioned to our wants; and when the public affections are adapted to our public connections, and proportioned to the wants and dangers of others.

Human virtue and perfection.

But the natural state, or the sound and vigorous constitution of any creature, or the just economy of its powers, we consider its health and perfection; and the acting agreeably to these, its virtue or goodness. Therefore, the health and perfection of man must lie in the aforesaid supremacy of conscience and reason, and in the subordination of the passions to their authority and direction; and his virtue or goodness must consist in acting agreeably to that order or economy. That such an ornament of the mind, and such a conduct of its powers and passions, will stand the test of reason, cannot admit of any dispute. For, upon a fair examination into the consequences of things, or the relations and aptitudes of means to ends, reason evidently demonstrates, and experience confirms it, that, to have our defensive passions duly proportioned to our dangers,

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is the surest way to avoid or get clear of them, and obtain the security we seek after. To proportion our private passions to our wants is the best means to supply them; and to adapt our public affections to our social relations and the good of others, is the most effectual method of fulfilling the one and procuring the other. In this sense, therefore, virtue may be said to be a conduct conformable to reason, as reason discovers an apparent aptitude, in such an order and economy of powers and passions, to answer the end for which they are naturally formed.

Connection between affections and ends.

If the idea of moral obligation is to be deduced merely from this aptitude or connection between certain passions, or a certain order and balance of passions, and certain ends obtained or to be obtained by them, then is reason or reflection, which perceives that aptitude or connection, the proper judge of moral obligation; and on this supposition it may be defined, as has been done by some, the connection between the affection and the end, or, which is the same thing, between the action and the motive; for the end is the motive or the final cause, and the affection is the action, or its immediate natural cause. A man, from mere self-love, may be induced to fulfil that obligation which is founded on the connection between the defensive passions and their ends, or that of the private passions and their ends; because in that case his own interest will prompt him to indulge them in the due proportion required. But if he has no affections which point beyond himself, no principle but self-love, or some subtile modification of it, what shall interest him in the happiness of others, where there is no connection between it and his own? or what sense can he have of moral obligation to promote it? Upon this scheme, therefore, without public or social affection, there could be no motive, and consequently no moral obligation, to a beneficent disinterested conduct.

But if the mere connection between certain passions or a certain order of passions, and certain ends, is what constitutes or gives us the idea of moral obligation, then why may not the appositeness of any temper or conduct, nay, of any piece of machinery, to obtain its end, form an equally strict moral obligation? for the connection and aptitude are as strong and invariable in the latter instances as in the former. But as this is confounding the most obvious differences of things, we must trace the idea of moral obligation to another and a more natural source.

Idea of it from experience.

Let us appeal, therefore, to our inmost sense and experience, how we stand affected to those different sets of passions, in the just measure and balance of which we found a right temper to consist. For this is entirely a matter of experience, in which we must examine, as in any other natural inquiry, what are the genuine feelings and operations of nature, and what affections or symptoms of them appear in the given instance.

Defensive passions.

The defensive passions, as anger and fear, give us pain rather than pleasure, yet we cannot help feeling them when provoked by injury, or exposed to harm. We account the creature imperfect that wants them, because they are necessary to his defence. Nay, we should in some measure condemn ourselves, did we want the necessary degree of resentment and caution. But if our resentment exceeds the wrong received, or our caution the evil dreaded, we then blame ourselves for having overacted our part. Therefore, whilst we are in danger, to be totally destitute of them we reckon a blameable defect, and to feel them in a just, that is, necessary measure, we approve, as suited to the nature and the condition of such a creature as man. But our security obtained, to continue to indulge them, we not only disapprove as hurtful, but condemn as unmanly, unbecoming, and mean spirited. Nor will such a conduct afford any self-approving joy when we coolly reflect upon it.

With regard to the private passions, such as love of life, pleasure, ease, and the like, as these aim at private good, and are necessary to the perfection and the happiness of the individual, we should reckon any creature defective, and even blameable, that was destitute of them. Thus, we condemn the man who imprudently ruins his fortune, impairs his health, or exposes his life; we not only pity him as an unfortunate creature, but feel a kind of moral indignation and contempt of him, for having made himself such. On the other hand, though a discreet self-regard does not attract our esteem and veneration, yet we approve of it in some degree, in a higher and different degree from what we would regard a well-contrived machine, as necessary to constitute a finished creature, nay, to complete the virtuous character, as exactly suited to our present indigent state. There are some passions respecting private good, towards which we feel higher degrees of approbation, as the love of knowledge, of action, of honour, and the like. We esteem them as marks of an ingenuous mind; and cannot help thinking the character in which they are wanting remarkably stupid, and in some degree immoral.

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Private passions.

Public passions.

With regard to the social affections, as compassion, natural affection, friendship, benevolence, and the like, we approve, admire, and love them in ourselves, and, in all in whom we discover them, with an esteem and approbation, if not different in kind, yet surely far superior in degree, to that which we feel towards the other passions. These we reckon necessary, just, and excellently fitted to our structure and state; and the creature which wants them we consider defective and ill constituted, a kind of abortion. But the public affections we esteem self-worthy, as originally and eternally amiable.

Distinction between vehement and calm affections.

But amongst the social affections we make an obvious and constant distinction, viz. between those particular passions which urge us with a sudden violence, and uneasy kind of sensation, to pursue the good of their respective objects, as pity, natural affection, and the like, and those calm dispassionate affections and desires which prompt us more steadily and uniformly to promote the happiness of others. The former we generally call passions, to distinguish them from the other sort, which go more commonly by the name of affections or calm desires. The one kind we approve, indeed, and delight in; but we feel still higher degrees of approbation and moral complacence towards the other, and towards all limitation of the particular instincts, by the principle of universal benevolence. The more objects the calm affections take in, and the worthier these objects are, their dignity rises in proportion, and with this our approbation keeps an exact pace. A character, on the other hand, which is quite divested of these public affections, and which feels no love for the species, but instead of it entertains malice, rancour, and ill will, we reckon totally immoral and unnatural.

Such, then, are the sentiments and dispositions which we feel when these several orders of affections pass before the mental eye. Therefore, that state in which we feel ourselves moved, in the manner above described, towards those affections and passions, as they come under the mind's review, and in which we are, instantaneously and independently of our choice or volition, prompted to a correspondent conduct, we call a state of moral obligation. Let us suppose, for instance, a parent, a friend, a benefactor, reduced to a condition of the utmost indigence and distress, and that it is in our power to give them immediate relief. To what conduct are we obliged? what duty does nature dictate and require in such a case? Attend to nature, and nature will tell, with a voice irresistibly audible and commanding to the human heart, with an authority which no man can silence without being self-condemned, and which no man can elude except at his peril, that immediate relief ought to be given. Again, let a friend, a neighbour, or even a stranger, have lodged a deposit in

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our hands, and after some time reclaim it; no sooner do these ideas of the confidence reposed in us, and of property not transferred, but deposited, occur, than we immediately and unavoidably feel and recognise the obligation to restore it. In both these cases we should condemn and even loathe ourselves if we acted otherwise, as having done, or omitted doing, what we ought not, as having acted beneath the dignity of our nature, and contrary to our most intimate sense of right and wrong; we should accuse ourselves as guilty of ingratitude, injustice, and inhumanity, and be conscious of deserving the censure, and therefore dread the resentment, of all rational beings. But in complying with the obligation, we feel joy and self-approbation, are conscious of an inviolable harmony between our nature and duty, and think ourselves entitled to the applause of every impartial spectator of our conduct.

Moral obligation.

To describe, therefore, what we cannot perhaps define, a state of moral obligation is that state in which a creature, endued with such senses, powers, and affections as man, would condemn himself, and think he deserved the condemnation of all others, should he refuse to fulfil it; but would approve himself, and expect the approbation of all others, upon complying with it.

Moral agent and moral action.

And we call him a *moral agent* who is in such a state, or who is subject to moral obligation. Therefore, as man's structure and connections often subject him to such a state of moral obligation, we conclude that he is a moral agent. But as man may sometimes act without knowing what he does, as in cases of frenzy or disease, or in many natural functions; or, knowing what he does, he may act without choice or affection, as in cases of necessity or compulsion; therefore, to denominate an action moral, namely, approveable or blameable, it must be done knowingly and willingly, or from affection and choice. A morally good action, then, consists in fulfilling a moral obligation knowingly and willingly; and a morally bad action, or an immoral action, is to violate a moral obligation knowingly and willingly.

Moral character and temper.

As not an action, but a series of actions, constitute a character; as not an affection, but a series of affections, constitute a temper; and as we denominate things by the gross, *a fortiori*, or by the qualities which chiefly prevail in them; therefore we call that a morally good character in which a series of morally good actions prevail, and that a morally good temper in which a series of morally good affections have the ascendant. A bad character and bad temper are the reverse. But where the above-mentioned order or proportion of passions is maintained, there a series of morally good affections and actions will prevail. Therefore, to maintain that order and proportion, is to have a morally good temper and character. But a morally good temper and character is moral rectitude, integrity, virtue, or the completion of duty.

How we come by the idea of moral obligation.

If it be asked, after all, how we come by the idea of moral obligation or duty, we may answer, that we come by it in the same way as by our other original and primary perceptions. We receive them all from nature, or the great Author of nature. For this idea of moral obligation is not a creature of the mind, nor dependent on any previous act of volition, but arises on certain occasions, or when certain other ideas are presented to the mind, as necessarily, instantaneously, and unavoidably, as pain does upon too near approach to the fire, or pleasure from the fruition of any good. It does not, for instance, depend upon our choice whether we shall feel the obligation to succour a distressed parent, or to restore a deposit intrusted to us when it is recalled. We cannot denominate this a compound idea, made up of one or more simple ideas. We may, indeed, nay we must, have some ideas antecedent to it, as, for instance, that of a parent in distress, of a child able to relieve, of the relation of the one to the other, of a trust, of right, and the like. But none of these ideas constitute the perception of obligation. This is an idea quite distinct from, and something supperadded to, the ideas of the correlatives, or the relation subsisting between them. These, indeed, by a law of our nature, are the occasion of suggesting it; but they are as totally different from it as colours are from sounds. By sense of reflection we perceive the correlatives; our memory recalls the favours or deposit which we received; the various circumstances of the case are matters of fact or experience; but some delicate inward organ or power, or call it what we please, does, by certain instantaneous sympathy, antecedent to the cool deductions of reason, and independently of previous instruction or volition, perceive the moral harmony, the living, irresistible charms, of moral obligation, which immediately interests the correspondent passions, and prompts us to fulfil its lawful dictates.

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The use of reason in moral cases.

We need not apprehend any danger from the quickness of its decisions, nor be frightened because it looks like instinct, and has been called so. Would we approve one for deliberating long, or reasoning the matter much at leisure, whether he should relieve a distressed parent, feed a starving neighbour, or restore the trust committed to him? should we not suspect the reasoner of knavery, or of very weak affections towards virtue? We employ reason, and worthily employ it, in examining the condition, relations, and other circumstances of the agent or patient, or of those with whom either of them is connected, that is, in other words, the state of the case; and in complicated cases, where the circumstances are many, it may require no small attention to find the true state of the case; but when the relations of the agent or patient, and the circumstances of the action, are obvious, or come out such after a fair trial, we should scarcely approve him who demurs on the obligation to that conduct which the case suggests.

Pleasure not the idea of obligation.

From what has been said, it is evident that it is not the pleasure or agreeable sensations which accompany the exercise of the several affections, nor those consequent on the actions, that constitute moral obligation, or excite in us the idea of it. That pleasure is posterior to the idea of obligation; and we are frequently obliged, and acknowledge ourselves under an obligation, to such affections and actions as are attended with pain; as in the trials of virtue, where we are obliged to sacrifice private to public good, or a present pleasure to a future interest. We have pleasure in serving an aged parent, but it is neither the perception nor prospect of that pleasure which gives us the idea of obligation to that conduct.

CHAP. III.—THE FINAL CAUSES OF OUR MORAL FACULTIES OF PERCEPTION AND AFFECTION.

The survey proposed.

We have now taken a general prospect of *man*, and of his moral powers and connections, and on these erected a scheme of duty or moral obligation, which seems to be confirmed by experience, consonant to reason, and approved by his most inward and most sacred senses. It may be proper, in the next place, to take a more particular view of the final causes of those delicate springs by which he is impelled to action, and of those clogs by which he is restrained from it. By this detail we shall be able to judge of their aptitude to answer their end, in a creature endowed with his capacities, subject to his wants, exposed to his dangers, and susceptible of his enjoyments; and from thence we shall be in a condition to pronounce concerning the end of his whole structure, its harmony with its state, and consequently its subserviency to answer the great and benevolent intentions of its Author.

The Supreme Being has seen fit to blend in the whole

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Inward anatomy of the system of mind.

of things a prodigious variety of discordant and contrary principles, light and darkness, pleasure and pain, good and evil. There are multifarious natures, higher and lower, and many intermediate ones between the widely-distant extremes. These are differently situated, variously adjusted, and subjected to each other, and all of them subordinate to the order and perfection of the whole. We may suppose man placed as in a centre amidst those innumerable orders of beings, by his outward frame drawing to the material system, and by his inward connected with the intellectual or moral, and of course affected by the laws which govern both, or affected by that good and that ill which result from those laws. In this infinite variety of relations with which he is surrounded, and of contingencies to which he is liable, he feels strong attractions to the good, and violent repulsions or aversions to the ill. But as good and ill are often blended, and wonderfully complicated one with the other; as they sometimes immediately produce and run up into each other, and at other times lie at great distances, yet by means of intervening links introduce one another; and as these effects are often brought about in consequence of hidden relations and general laws, of the energy of which he is an incompetent judge; it is easy for him to mistake good for evil, and evil for good, and consequently he may be frequently attracted by such things as are destructive, or repel such as are salutary. Thus, by the tender and complicated frame of his body, he is subjected to a great variety of ills, to sickness, cold, heat, fatigue, and innumerable wants. Yet his knowledge is so narrow withal, and his reason so weak, that in many cases he cannot judge, in the way of investigation or reasoning, of the connections of those effects with their respective causes, or of the various latent energies of natural things. He is therefore informed of this connection by the experience of certain senses or organs of perception, which, by a mechanical instantaneous motion, feel the good and the ill, receiving pleasure from the one and pain from the other. By these, without any reasoning, he is taught to attract or choose what tends to his welfare, and to repel and avoid what tends to his ruin. Thus, by his senses of taste and smell, or by the pleasure he receives from certain kinds of food, he is admonished which kind agrees with his constitution; and by an opposite sense of pain he is informed which sort disagrees, or is destructive of it; but he is not by means of this instructed in the inward nature and constitution of things.

Use of appetites and passions.

Some of those senses are armed with strong degrees of uneasiness or pain, in order to urge him to seek after such objects as are suited to them; and these respect his more immediate and pressing wants, as the sense of hunger, thirst, cold, and the like; which, by their painful importunities, compel him to provide food, drink, raiment, shelter. Those instincts by which we are thus prompted with some kind of commotion or violence to attract and pursue good, or to repel and avoid evil, we call appetites and passions. By our senses, then, we are informed of what is good or ill to the private system, or the individual; and by our private appetites and passions we are impelled to the one, and restrained from the other.

Man's outward state.

In consequence of this machinery, and the great train of wants to which our nature subjects us, we are engaged in a continued series of occupations, which often require much application of thought, or great bodily labour, or both. The necessaries of life, food, clothes, shelter, and the like, must be provided; conveniences must be acquired to render life still more easy and comfortable. In order to obtain these, arts, industry, manufactures, and trade are necessary; and to secure to us the peaceable enjoyment of their fruits, civil government, policy, and laws must be contrived, and the various business of public life carried on. Thus, whilst man is concerned and busied in making provision or obtaining security for himself, he is by degrees engaged in connections with a family, friends, neighbours, a community, or a commonwealth. Hence arise new wants, new interests, new cares, and new employments. The passions of one man interfere with those of another; interests are opposed; competitions arise, contrary courses are taken; disappointments happen, distinctions are made, and parties formed. This opens a vast scene of distraction and embarrassment, and introduces a mighty train of good and ill, both public and private. Yet, amidst all this confusion and hurry, plans of action must be laid, consequences foreseen or guarded against, inconveniences provided for; and frequently particular resolutions must be taken, and schemes executed, without reasoning or delay. Now what provision has the Author of our nature made for this necessitous condition? how has he fitted the actor, man, for playing his part in this perplexed and busy scene? Our Supreme Parent, watchful of the whole, has not left himself without a witness here neither, and has made nothing imperfect, but all things are double one against the other. He has not left man to be informed only by the cold notices of reason, of the good or evil, the happiness or misery, of his fellow-creatures. He has made him sensible of their good and happiness, but especially of their ill and misery, by an immediate sympathy, or quick feeling of pleasure and of pain.

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Pity.

The latter we denominate *pity* or *compassion*. For the former, though every one who is not quite divested of humanity feels it in some degree, we have not got a name, unless we call it *congratulation* or joyful *sympathy*, or that good humour which arises on seeing others pleased or happy. Both these feelings have been called in general the public or common sense, κοινη μνημοσυνη, by which we feel for others, and are interested in their concerns as really as, though perhaps less sensibly than, in our own.

Resentment.

When we see our fellow-creatures unhappy through the fault or injury of others, we feel resentment or indignation against those who have unjustly caused that misery. If we are conscious that it has happened through our fault or injurious conduct, we feel shame; and both these classes of senses and passions, regarding misery and wrong, are armed with such sharp sensations of pain, as not only prove a powerful guard and security to the species, or public system, against those evils it may, but serve also to lessen or remove those evils it does, suffer. Compassion draws us out of ourselves to bear a part of the misfortunes of others, powerfully solicits us in their favour, melts us at the sight of their distress, and makes us in some degree unhappy till they are relieved from it. It is peculiarly well adapted to the condition of human life, because it is much more and oftener in our power to do mischief than good, and to prevent or lessen misery than to communicate positive happiness; and therefore it is an admirable restraint upon the more selfish passions, or those violent impulses which carry us to the hurt of others.

Public affections.

There are other particular instincts or passions which interest us in the concerns of others, even whilst we are most busy about our own, and which are strongly attractive of good, and repulsive of evil to them. Such are natural affection, friendship, love, gratitude, desire of fame, love of society, of one's country, and others that might be named. Now as the private appetites and passions were found to be armed with strong sensations of desire and uneasiness, to prompt man the more effectually to sustain labours, and to encounter dangers in pursuit of those goods which are necessary to the preservation and welfare of the individual, and to avoid those evils which tend to his destruction; in like manner, it was necessary that this other class of desires and affections should be prompted with as quick sensations of pain, not only to counteract the strength of their antagonists, but to engage us in a virtuous activi-

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ty for our relations, families, friends, neighbours, country. Indeed our sense of right and wrong will admonish us that it is our duty, and reason and experience further assure us that it is both our interest and best security, to promote the happiness of others; but that sense, that reason, and that experience, would frequently prove very weak and ineffectual prompters to such a conduct, especially in cases of danger and hardship, and amidst all the importunities of nature, and that constant hurry in which the private passions involve us, without the aid of those particular kind affections which mark out to us particular spheres of duty, and engage and fix us down to them as it were with an agreeable violence.

Contrast or balance of passions.

It is evident, therefore, that those two classes of affection, the private and public, are set one against the other, and designed to control and limit each other's influence, and thereby to produce a just balance in the whole.[1] In general, the violent sensations of pain and uneasiness which accompany hunger, thirst, and the other private appetites, or too great fatigue of mind as well as of body, prevent the individual from running to great excesses in the exercise of the higher functions of the mind, as too intense thought in the search of truth, violent application to business of any kind, and different degrees of romantic heroism. On the other hand, the finer senses of perception, and those generous desires and affections which are connected with them, the love of action, of imitation, of truth, honour, public virtue, and the like, are wisely placed in the opposite scale, in order to prevent us from sinking into the dregs of the animal life, and debasing the dignity of man below the condition of brutes. So that, by the mutual reaction of those opposite powers, the bad effects are prevented that would naturally result from their acting singly and apart, and the good effects are produced which each are severally formed to produce.

Contrast or balance of public and private passions.

The same wholesome opposition appears likewise in the particular counter-workings of the private and public affections one against the other. Thus compassion is adapted to counterpoise the love of ease, of pleasure, and of life, and to disarm or to set bounds to resentment; and resentment of injury done to ourselves, or to our friends who are dearer than ourselves, prevents an effeminate compassion or consternation, and gives us a noble contempt of labour, pain, and death. Natural affection, friendship, love of one's country, nay zeal for any particular virtue, are frequently more than a match for the whole train of selfish passions. On the other hand, without that intimate overruling passion of self-love, and those private desires which are connected with it, the social and the tender instincts of the human heart would degenerate into the wildest dotage, the most torturing anxiety, and downright frenzy.

Contrasts amongst those of the same classes.

But not only are the different orders or classes of affection checks upon one another, but passions of the same classes are mutual clogs. Thus, how many are withheld from the violent outrages of resentment by fear; and how easily is fear controlled in its turn, whilst mighty wrongs awaken a mighty resentment. The private passions often interfere, and therefore moderate the violence of each other; and a calm self-love is placed at their head, to direct, to influence, and to control their particular attractions and repulsions. The public affections likewise restrain one another; and all of them are put under the control of a calm dispassionate benevolence, which ought in like manner to direct and limit their particular motions. Thus most part, if not all the passions, have a twofold aspect, and serve a twofold end. In one view they may be considered as powers, impelling mankind to a certain course, with a force proportioned to the apprehended amount of the good they aim at. In another view they appear as weights, balancing the action of the powers, and controlling the violence of their impulses. By means of these powers and weights a natural equipoise is settled in the human breast by its all-wise Author, by which the creature is kept tolerably steady and regular in his course, amidst that variety of stages through which he must pass.

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Perceptions or instincts of approbation.

But this is not all the provision which God has made for the hurry and perplexity of the scene in which man is destined to act. Amidst those infinite attractions and repulsions towards private and public good and evil, mankind either cannot often foresee the consequences or tendencies of all their actions towards one or other of these, especially where those tendencies are intricate and point different ways, or those consequences remote and complicated; or, though, by careful and cool inquiry, and a due improvement of their rational powers, they might find them out, yet, distracted as they are with business, amused with trifles, dissipated by pleasure, and disturbed by passion, they neither have found nor can find any leisure to attend to those consequences, or to examine how far this or that conduct is productive of private or public good on the whole. Therefore, were it left entirely to the slow and sober deductions of reason to trace those tendencies, and make out those consequences, it is evident, that in many particular instances the business of life must stand still, and many important occasions of action be lost, or perhaps the grossest blunders be committed. On this account, the Deity, besides that general approbation which we bestow on every degree of kind affection, has moreover implanted in man many particular perceptions or determinations to approve of certain qualities or actions, which, in effect, tend to the advantage of society, and are connected with private good, though he does not always see that tendency, nor mind that connection. And these perceptions or determinations do, without reasoning, point out, and, antecedent to views of interest, prompt to a conduct beneficial to the public, and useful to the private system. Such is that sense of candour and veracity, that abhorrence of fraud and falsehood, that sense of fidelity, justice, gratitude, greatness of mind, fortitude, clemency, decorum, and that disapprobation of knavery, injustice, ingratitude, meanness of spirit, cowardice, cruelty, and indecorum, which are natural to the human mind. The former of those dispositions, and the actions flowing from them, are approved, and those of the latter kind disapproved, by us, even abstracted from the view of their tendency or conduciveness to the happiness or misery of others or of ourselves. In one we discern a beauty, a superior excellency, a congruity to the dignity of man; in the other a deformity, a littleness, a debasement, of human nature.

There are other principles also connected with the good of society, or the happiness and perfection of the individual, though that connection is not immediately apparent, which we behold with real complacency and approbation, though perhaps inferior in degree, if not in kind, such as gravity, modesty, simplicity of deportment, temperance, prudent economy; and we feel some degree of contempt and dislike where they are wanting, or where the opposite qualities prevail. These and the like perceptions or feelings are either different modifications of the moral sense, or subordinate to it, and plainly serve the same important purpose, being, in the several emergencies of a various and distracted life, expeditious monitors of what is right, what is wrong, what is to be pursued, and what avoided; and, by the pleasant or painful consequences which attend them, exerting their influence as powerful prompters to a suitable conduct.

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[1] Vide Hutcheson's Conduct of the Passions, treat. i. sect. 2.

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From a slight inspection of the above-named principles, it is evident that they all carry a friendly aspect to society and the individual, and have a more immediate or a more remote tendency to promote the perfection or good of both. This tendency cannot be always foreseen, and would be often mistaken or seldom attended to by a weak, busy, short-sighted creature like man, both rash and variable in his opinions, a dupe to his own passions or to the designs of others, and liable to sickness, to want, and to error. Principles, therefore, which are so nearly linked with private security and public good, by directing him, without operose reasoning, where to find the one, and how to promote the other, and by prompting him to a conduct conducive to both, are admirably adapted to the exigencies of his present state, and wisely calculated to obtain the ends of universal benevolence.

Passions fitted to a state of trial.

It were easy, by considering the subject in another light, to show, in a curious detail of particulars, how wonderfully the inner part of man, or that astonishing train of moral powers and affections with which he is endowed, is fitted to the several stages of that progressive and probationary state through which he is destined to pass. As our faculties are narrow and limited, and rise from very small and imperfect beginnings, they must be improved by exercise, by attention, and by repeated trials. And this holds true, not only of our intellectual, but also of our moral and active powers. The former are liable to errors in speculation, the latter to blunders in practice, and both often terminate in misfortunes and pains; and those errors and blunders are generally owing to our passions, or to our too forward and warm admiration of those partial goods they naturally pursue, or to our fear of those partial evils they naturally repel. Those misfortunes, therefore, lead us back to consider where our misconduct lay, and whence our errors flowed; and consequently they are salutary pieces of trial, which tend to enlarge our views, to correct and refine our passions, and consequently to improve both our intellectual and moral powers. Our passions, then, are the rude materials of our virtue, which Heaven has given us to work up, and to refine and polish into a harmonious and divine piece of workmanship. They furnish out the whole machinery, the calms and storms, the lights and shadows, of human life. They show mankind in every attitude and variety of character, and give to virtue both its struggles and its triumphs. To conduct them well in every state, is merit; to abuse or misapply them, is demerit.

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The different sets of senses, powers, and passions, which unfold themselves in these successive stages, are both necessary and adapted to that rising and progressive state. Enlarging views and growing connections require new passions and new habits; and thus the mind, by these continually expanding and finding a progressive exercise, rises to higher improvements, and pushes forward towards maturity and perfection.

Harmony of our structure and state.

In this beautiful economy and harmony of our structure, both outward and inward, with that state, we may at once discern the great lines of our duty traced out in the fairest and brightest characters, and contemplate with admiration a more august and marvellous scene of divine wisdom and goodness laid in the human breast, than we shall perhaps find in the whole compass of nature.

From this detail, then, it appears that man, by his original frame, is made for a temperate, compassionate, benevolent, active, and progressive state. He is strongly attractive of the good and repulsive of the evils which befall others as well as himself. He feels the highest approbation and moral complacence in those affections, and in those actions, which immediately and directly respect the good of others, and the highest disapprobation and abhorrence of the contrary. Besides these, he has many particular perceptions or instincts of approbation, which, though perhaps not of the same kind with the others, yet are accompanied with correspondent degrees of affection, proportioned to their respective tendencies to the public good. Therefore, by acting agreeably to these principles, man acts agreeably to his structure, and fulfils the benevolent intentions of its Author. But we call a thing good when it answers its end, and a creature good when he acts in a conformity to his constitution; consequently man must be denominated good or virtuous when he acts suitably to the principles and destination of his nature.

PART II.

CHAP. I.—THE PRINCIPAL DISTINCTIONS OF DUTY OR VIRTUE.

General division of duty.

We have now considered the constitution and the connections of man, and upon these erected a general system of duty or moral obligation, consonant to reason, approved by his most sacred and intimate sense, suitable to his mixed condition, and confirmed by the experience of mankind. We have also traced the final causes of his moral faculties and affections to those noble purposes they serve, with regard both to the private and the public system. From this induction it is evident, that there is one order or class of duties which man owes to himself; another to society; and a third to God.

Duty to one's self.

The duties he owes to himself are founded chiefly upon the defensive and private passions, which prompt him to pursue whatever tends to private good or happiness, and to avoid or ward off whatever tends to private evil or misery. Amongst the various goods which allure and solicit him, and the various evils which attack or threaten him, to be intelligent and accurate in selecting the one and rejecting the other, or in preferring the most excellent goods, and avoiding the most terrible evils, when there is a competition amongst either, and to be discreet in using the best means to attain the goods and to avoid the evils, is what we call *prudence*. This, in our inward frame, corresponds to sagacity, or quickness of sense, in our outward. To proportion our defensive passions to our dangers, we call *fortitude*; which always implies a just mixture of calm resentment or animosity, and well-governed caution; and this firmness of mind answers to the strength and muscular energy of the body. And duly to adjust our private passions to our wants, or to the respective importance of the good we affect or pursue, we call *temperance*; which does therefore always imply, in this large sense of the word, a just balance or command of the passions.

Duties to society.

The second class of duties arises from the public or social affections, the just harmony or proportion of which to the dangers and wants of others, and to the several relations we bear, commonly goes by the name of *justice*. This includes the whole of our duty to society, to our parents, and to the general polity of nature, particularly gratitude, friendship, sincerity, natural affection, benevolence, and the other social virtues; which being the noblest temper and fairest complexion of the soul, corresponds to the beauty and fine proportion of the person. The virtues comprehended under the former class, especially prudence and fortitude, may likewise be transferred to this; and, according to the various circumstances in which the are placed, and the more confined or more extensive sphere in which they operate, may be denominated *private*, *economical*, or *civil prudence*, *fortitude*, &c. These direct our

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conduct with regard to the wants and dangers of those lesser or greater circles with which they are connected.

The third class of duties respects the Deity, and arises from the public affections, and the several glorious relations which he sustains to us as our Creator, Benefactor, Lawgiver, Judge, &c. We choose to consider this set of duties in the last place; because, though prior in dignity and excellency, they seem to be last in order of time, it being the most simple and easy method to follow the gradual progress of nature, as it takes its rise from individuals, and spreads through the social system, and still ascends upwards, until at length it stretches to its almighty Parent and Head, and so terminates in those duties which are highest and best.

The duties resulting from these relations are, reverence, gratitude, love, resignation, dependence, obedience, worship, praise; which, according to the model of our fine capacities, must maintain some sort of proportion to the grandeur and perfection of the object whom we venerate, love, and obey. This proportion or harmony is expressed by the general name of *piety* or *devotion*, which is always stronger or weaker, according to the greater or less apprehended excellency of its object. This sublime principle of virtue is the enlivening soul which animates the moral system, and that cement which binds and sustains the other duties which man owes to himself or to society.

Conscience.

This, then, is the general temper and constitution of virtue, and these are the principal lines or divisions of duty. To those good dispositions which respect the several objects of our duty, and to all actions which flow from such dispositions, the mind gives its sanction or testimony; and this sanction or judgment concerning the moral quality, or the goodness of actions or dispositions, moralists call *conscience*. When it judges of an action which is to be performed, it is called an antecedent conscience; and when it passes sentence on an action which is performed, it is called a subsequent conscience. The tendency of an action to produce happiness, or its external conformity to a law, is termed its material goodness; but the good dispositions from which an action proceeds, or its conformity to law in every respect, constitutes its formal goodness.

When the mind is ignorant or uncertain about the character of an action, or its tendency to private or public good; or when there are several circumstances in the case, some of which, being doubtful, render the mind dubious concerning the morality of the action, that is called a doubtful or scrupulous conscience; if it mistakes concerning these, it is called an erroneous conscience. If the error or ignorance be involuntary or invincible, the action proceeding from that error, or from that ignorance, is reckoned innocent, or not imputable. If the error or ignorance be supine or affected, that is, the effect of negligence, or of affectation and wilful inadvertence, the conduct flowing from such error, or such ignorance, is criminal and imputable. Not to follow one's conscience, though erroneous and ill informed, is criminal, as it is the guide of life; and to counteract it, shows a depraved and incorrigible spirit. Yet to follow an erroneous conscience is likewise criminal, if that error which misled the conscience was the effect of inattention, or any criminal passion.[1]

If it be asked, how an erroneous conscience shall be rectified, since it is supposed to be the only guide of life, and judge of morals; we answer, in the very same way that we would rectify reason if at any time it should judge wrong, as it often does, viz. by giving it proper and sufficient materials for judging right, that is, by inquiring into the whole state of the case, the relations, connections, and several obligations of the actor, the consequences and other circumstances of the action, or the surplusage of private or public good which results, or is likely to result, from the action, or from the omission of it. If those circumstances are fairly and fully stated, the conscience will be just and impartial in its decision; for, by a necessary law of our nature, it approves and is well affected towards the moral form; and if it seems to approve of vice or immorality, it is always under the notion or mask of some virtue. So that, strictly speaking, it is not conscience which errs; for its sentence is always conformable to the view of the case which lies before it, and is just, upon the supposition that the case is truly such as it is represented to be. All the fault is to be imputed to the agent, who neglects to be better informed, or who, through weakness or wickedness, hastens to pass sentence from imperfect evidence.

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CHAP. II.—OF MAN'S DUTY TO HIMSELF, AND OF THE NATURE OF GOOD, AND THE CHIEF GOOD.

Divisions of good.

Every creature, by the constitution of his nature, is determined to love himself; to pursue whatever tends to his preservation and happiness, and to avoid whatever tends to his hurt and misery. Being endowed with sense and perception, he must necessarily receive pleasure from some objects, and pain from others. Those objects which give pleasure are called good; and those which give pain, evil. To the former he feels that attraction or motion which we call *desire* or *love;* to the latter, that impulse which we call *aversion* or *hatred*. To objects which suggest neither pleasure nor pain, and are conceived to be of no use to procure the one or ward off the other, we feel neither desire nor aversion; and such objects are called *indifferent*. Those objects which do not of themselves produce pleasure or pain, but are the means of procuring either, we call *useful* or *noxious*. Towards them we are affected in a subordinate manner, or with an indirect and reflective rather than a direct and immediate affection. All the original and particular affections of our nature lead us out to and ultimately rest in the first kind of objects, viz. those which give immediate pleasure, and which we therefore consider as directly good. The calm affection of self-love alone is conversant about such objects as are only consequentially good, or merely useful to ourselves.

Moral good.

But, besides those sorts of objects which we call *good;* merely and solely as they give pleasure, or are the means of procuring it, there is a higher and nobler species of good, towards which we feel that peculiar movement we call *approbation* or *moral complacency;* and which we therefore denominate *moral good*. Such are our affections, and the actions consequent on them. The perception of this is, as has been already observed, quite distinct in kind from the perception of other species; and though it may be connected with pleasure or advantage by the benevolent constitution of nature, yet it constitutes a good independent of that pleasure and that advantage, and far superior, not only in degree, but in dignity, to both. The other, viz. the *natural good*, consists in obtaining those pleasures which are adapted to the peculiar senses and passions susceptible of them, and is as various as are those senses and passions. This moral good consists in the right conduct of the several senses and passions, or their just proportion and accommodation to their respective objects and relations, and is of a more simple and invariable kind.

Human happiness.

By our several senses we are capable of a great variety of pleasing sensations. These constitute distinct ends or objects ultimately pursuable for their own sake. To these ends, or ultimate objects, correspond peculiar appetites or

[1] Hutcheson's Moral Inst., lib. ii. c. 3.

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affections, which prompt the mind to pursue them. When these ends are attained, there it rests, and looks no farther. Whatever therefore is pursuable, not on its own account, but as subservient or necessary to the attainment of something else which is intrinsically valuable for its own sake, be that value ever so great or ever so small, we call a *mean*, and not an *end*; so that ends and means constitute the materials or the very essence of our happiness. Consequently happiness, that is, human happiness, cannot be one simple uniform thing in creatures constituted as we are, with such various senses of pleasure, and such different capacities of enjoyment. Now the same principle or law of our nature which determines us to pursue any one end or species of good, prompts us to pursue every other end or species of good of which we are susceptible, or to which our Maker has adapted an original propensity. But, amidst the great multiplicity of ends or goods which form the various ingredients of our happiness, we perceive an evident gradation, or subordination suited to that gradation, of senses, powers, and passions, which prevails in our mixed and various constitution, and to that ascending series of connections which open upon us in the different stages of our progressive state.

Gradation of goods.

Thus the goods of the body, or of the external senses, seem to hold the lowest rank in this gradation or scale of goods. These we have in common with the brutes; and though many men are grovelling enough to pursue the goods of the body with a more than brutal fury, yet, when at any time they come in competition with goods of an higher order, the unanimous verdict of mankind, by giving the last the preference, condemns the first to the meanest place. Goods consisting in exterior social connections, as fame, fortune, power, civil authority, seem to succeed next, and are chiefly valuable as the means of procuring natural or moral good, but principally the latter. Goods of the intellect are still superior, as taste, knowledge, memory, judgment, and so forth. The highest are moral goods of the mind, directly and ultimately regarding ourselves, as command of the appetites and passions, prudence, fortitude, benevolence, and the like. These are the great objects of our pursuit, and the principal ingredients of our happiness. Let us consider each of them as they rise one above the other in this natural series or scale, and then touch briefly upon our obligations to pursue them.

Goods of the body.

Those of the body are health, strength, agility, hardiness, and patience of change, neatness, and decency.

Good health, and a regular easy flow of spirits, are in themselves sweet natural enjoyments, a great fund of pleasure, and indeed the proper seasoning which gives a flavour and poignancy to every other pleasure. The want of health unfits us for most duties of life, and is especially an enemy to the social and humane affections, as it generally renders the unhappy sufferer peevish and sullen, disgusted with the allotments of Providence, and consequently apt to entertain suspicious and gloomy sentiments of its author. It obstructs the free exercise and full improvement of our reason, and makes us a burden to our friends, and useless to society; whereas the uninterrupted enjoyment of good health is a constant source of good humour, and good humour is a great friend to openness and benignity of heart; enabling us to encounter the various evils and disappointments of life with more courage, or to sustain them with more patience, and conducing much, if we are otherwise duly qualified, to our acting our part in every exigency of life with more firmness, consistency, and dignity. It therefore imports us much to preserve and improve a habit or enjoyment, without which every other external entertainment is tasteless, and most other advantages of little avail; and this is best done by a strict temperance in diet and regimen, by regular exercise, and by keeping the mind serene and unruffled by violent passions, and unsubdued by intense and constant labours, which greatly impair and gradually destroy the strongest constitutions.

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Strength, agility, hardiness, and patience of change, suppose health, and are unattainable without it; but they imply something more, and are necessary to guard it, to give us the perfect use of our lives and limbs, and to secure us against many otherwise unavoidable evils. The exercise of the necessary manual, and of most of the elegant arts of life, depends on strength and agility of body; personal dangers, private and public dangers, the demands of our friends, our families, and country, require them; they are necessary in war, and ornamental in peace; fit for the employment of a country and a town life, and they exalt the entertainments and diversions of both. They are chiefly obtained by moderate and regular exercise.

Few are so much raised above want and dependence, or so exempted from business and care, as not to be often exposed to inequalities and changes of diet, exercise, air, climate, and other irregularities. Now, what can be so effectual to secure one against the mischiefs arising from such unavoidable alterations, as hardiness, and a certain versatility of constitution which can bear extraordinary labours, and submit to great changes, without any sensible uneasiness or bad consequences. This is best attained, not by an over great delicacy and minute attention to forms, or by an invariable regularity in diet, hours, and way of living, but rather by a bold and discreet latitude of regimen. Besides, deviations from established rules and forms of living, if kept within the bounds of sobriety and reason, are friendly to thought and original sentiments, animate the dull scene of ordinary life and business, and agreeably stir the passions, which stagnate or breed ill humour in the calms of life.

Neatness, cleanliness, and decency, to which we may add dignity of countenance and demeanour, seem to have something refined and moral in them, at least we generally esteem them indications of an orderly, genteel, and well-governed mind, conscious of an inward worth, and the respect due to one's nature; whereas nastiness, slovenliness, awkwardness, and indecency, are shrewd symptoms of something mean, careless, and deficient, and betray a mind untaught, illiberal, and unconscious of what is due to one's self or to others. How much cleanliness conduces to health needs hardly to be mentioned; and how necessary it is to maintain one's character and rank in life, and to render us agreeable to others as well as to ourselves, is as evident. There are certain motions, airs, and gestures, which become the human countenance and form, in which we perceive a comeliness, openness, simplicity, and gracefulness; and there are others which, to our sense of decorum, appear uncomely, affected, disingenuous, and awkward, quite unsuitable to the native dignity of our face and form. The first are in themselves the most easy, natural, and commodious, give one boldness and presence of mind, a modest assurance, an address both dignified and alluring; they bespeak candour and greatness of mind, raise the most agreeable prejudices in one's favour, render society engaging, command respect and often love, and give weight and authority both in conversation and business; in fine, they are the colouring of virtue, which show it to the greatest advantage in whomsoever it exists, and not only imitate, but in some measure supply it where it is wanting. Whereas the last, viz. rudeness, affectation, indecorum, and the like, have all the contrary effects; they are burdensome to one's self, a dishonour to our nature, and a nuisance in society. The former qualities or goods are best attained by a liberal education, by preserving a just sense of the dignity of our nature, by keeping the best and politest company, and, above all, by acquiring those virtuous and ennobling habits of mind which are decency in per-

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fection, which give an air of unaffected grandeur, and spread a lustre truly engaging over the whole form and deportment.

Goods of exterior social connections.

We are next to consider those goods which consist in exterior social connections, as fame, fortune, civil authority, and power.

The first has a twofold aspect, as a good pleasant in itself, or gratifying to an original passion, and then as expedient or useful towards a further end. Honour from the wise and good, on account of virtuous conduct, is regaling to a good man, for then his heart re-echoes to the grateful sound. There are few persons quite indifferent even to the commendation of the vulgar. Though we cannot approve that conduct which proceeds from this principle, and not from good affection or love of the conduct itself, yet, as it is often a guard and additional motive to virtue in creatures imperfect as we are, and often distracted by interfering passions, it might be dangerous to suppress it altogether, however wise it may be to restrain it within due bounds, and however laudable to use it only as a scaffolding to our virtue, which may be taken down when that glorious structure is finished, but hardly till then. To pursue fame for itself, is innocent; to regard it only as an auxiliary to virtue, is noble; to seek it chiefly as an engine of public usefulness, is still more noble, and highly praiseworthy. For though the opinion and breath of men are transient and fading things, often obtained without merit, and lost without cause, yet as our business is with men, and as our capacity of serving them is generally increased in proportion to their esteem of us, therefore sound and well-established moral applause may and will be modestly, not ostentatiously, sought after by the good; not indeed as a solitary refined sort of luxury, but as a public and proper instrument to serve and bless mankind. At the same time they will learn to despise that reputation which is founded on rank, fortune, and any other circumstances or accomplishments which are foreign to real merit, or to useful services done to others, and think that praise of little avail which is purchased without desert, and bestowed without judgment.

Fortune, power, and civil authority, or whatever is called influence and weight amongst mankind, are goods of the second division, that is, valuable and pursuable only as they are useful, or as means to a further end, namely, procuring or preserving the immediate objects of enjoyment or happiness to ourselves or others. Therefore to love such goods on their own account, and to pursue them as the ends, not the means, of enjoyment, must be highly preposterous and absurd. There can be no measure, no limit, to such pursuit; all must be whim, caprice, extravagance. Accordingly, such appetites, unlike all the natural ones, are increased by possession, and whetted by enjoyment. They are always precarious, and never without fears, because the objects lie without one's self; they are seldom without sorrow and vexation, because no accession of wealth or of power can satisfy them. But if those goods are considered only as the materials or means of private or public happiness, then the same obligations which bind us to pursue the latter, bind us likewise to pursue the former. We may, and no doubt we ought to, seek such a measure of wealth as is necessary to supply all our real wants, to raise us above servile dependence, and to provide us with such conveniences as are suited to our rank and condition in life. To be regardless of this measure of wealth, is to expose ourselves to all the temptations of poverty and corruption, to forfeit our natural independence and freedom, to degrade, and consequently to render the rank we hold, and the character we sustain, in society, useless, if not contemptible. When these important ends are secured, we ought not to murmur or repine that we possess not more; yet we are not secluded by any obligation, moral or divine, from seeking more, in order to give us that happiest and most godlike of all powers, the power of doing good. A supine indolence in this respect is both absurd and criminal; absurd, as it robs us of an inexhaustible fund of the most refined and durable enjoyments; and criminal, as it renders us so far useless to the society to which we belong. That pursuit of wealth which goes beyond the former end, viz. the obtaining the necessaries, or such conveniences, of life, as, in the estimation of reason, not of vanity or passion, are suited to our rank and condition, and yet is not directed to the latter, namely, the doing good, is what we call *avarice*. And that pursuit of power which, after securing one's self, that is, having attained the proper independence and liberty of a rational social creature, is not directed to the good of others, is what we call *ambition*, or the *lust of power*. To what extent the strict measures of virtue will allow us to pursue either wealth or power, and civil authority, it is not perhaps possible precisely to determine. That must be left to prudence, and the peculiar character, condition, and other circumstances, of each man. Only thus far a limit may be set, that the pursuit of either must not encroach upon any other duty or obligation which we owe to ourselves, to society, or to its parent and head. The same reasoning is to be applied to power as to wealth. It is only valuable as an instrument of our own security, and of the free enjoyment of those original goods it may, and often does, administer to us, and as an engine of more extensive happiness to our friends, our country, and mankind.

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Now the best, and indeed the only way to obtain a solid and lasting fame, is an uniform inflexible course of virtue; the employing one's ability and wealth in supplying the wants, and using one's power in promoting or securing the happiness, the rights and liberties, of mankind, joined to an universal affability and politeness of manners. And surely one will not mistake the matter much, who thinks the same course conducive to the acquiring greater accessions both of wealth and power; especially if he add to those qualifications a vigorous industry, a constant attention to the characters and wants of men, to the conjunctures of times, and continually varying genius of affairs; and a steady, intrepid honesty, that will neither yield to the allurements, nor be overawed with the terrors, of that corrupt and corrupting scene in which we live. We have sometimes heard indeed of other ways and means, as fraud, dissimulation, servility, and prostitution, and the like ignoble arts, by which the men of the world (as they are called), shrewd politicians, and persons of address, amass wealth and procure power; but as we want rather to form a man of virtue, an honest, contented, happy man, we leave to the men of the world their own ways, and permit them, unenvied and unimitated by us, to reap the fruit of their doings.

Goods of the intellect.

The next species of objects in the scale of good, are the goods of the intellect, as knowledge, memory, judgment, taste, sagacity, docility, and whatever else we call intellectual virtues. Let us consider them a little, and the means as well as obligations to improve them.

As man is a rational creature, capable of knowing the differences of things and actions; as he not only sees and feels what is present, but remembers what is past, and often foresees what is future; as he advances from small beginnings by slow degrees, and with much labour and difficulty, towards knowledge and experience; as his opinions sway his passions, as his passions influence his conduct, and as his conduct draws consequences after it which extend not only to the present, but to the future time, and is therefore the principal source of his happiness or misery; it is evident that he is formed for intellectual improvements, and that it must be of the utmost consequence for him to improve and cultivate his intellectual powers, on

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which these opinions, those passions, and that conduct, entirely depend.[1]

But besides the future consequences and importance of improving our intellectual powers, their immediate exercise on their proper objects yields the most rational and refined pleasures. Knowledge, and a right taste in the arts of imitation and design, as poetry, painting, sculpture, music, architecture, afford not only an innocent, but a most sensible and sublime entertainment. By these the understanding is instructed in ancient and modern life, the history of men and things, the energies and effects of the passions, the consequences of virtue and vice; by these the imagination is at once entertained and nourished with the beauties of nature and art, lighted up and spread out with the novelty, grandeur, and harmony of the universe; and, in fine, the passions are agreeably roused, and suitably engaged, by the greatest and most interesting objects which can fill the human mind. He who has a taste formed for those ingenious delights, and plenty of materials to gratify it, can never want the most agreeable exercise and entertainment, nor once have reason to make that fashionable complaint of the tediousness of time. Nor can he want a proper subject for the discipline and improvement of his heart. For, being daily conversant with beauty, order, and design, in inferior subjects, he bids fair for growing in due time an admirer of that which is fair and well-proportioned in the conduct of life and the order of society, the latter being only order and design exerted in their highest subject. He will learn to transfer the numbers of poetry to the harmony of the mind and of well-governed passions; and, from admiring the virtues of others in moral paintings, come to approve and imitate them himself. To cultivate a true and correct taste, therefore, must be both our interest and our duty, when the circumstances of our station give leisure and opportunity for it, and when the doing of it is not inconsistent with our higher obligations or engagements to society and mankind.

It is best attained by reading the best books, where good sense has more the ascendant than learning, and which pertain more to practice than to speculation; by studying the best models, or those which profess to imitate nature most, and approach the nearest to it; and by conversing with men of the most refined taste, and the greatest experience in life.

As to the other intellectual goods, what a fund of entertainment must it be to investigate the truth and various relations of things, to trace the operations of nature to general laws, to explain by these its manifold phenomena, to understand that order by which the universe is upheld, and that economy by which it is governed; to be acquainted with the human mind, the connections, subordinations, and uses of its powers, and to mark their energy in life: how agreeable to the ingenious inquirer, to observe the manifold relations and combinations of individual minds in society, to discern the causes why they flourish or decay, and thence to ascend, through the vast scale of beings, to that general Mind which presides over all, and operates unseen in every system and in every age, throughout the whole compass and progression of nature. Devoted to such entertainments as these, the contemplative have abandoned every other pleasure, retired from the body, so to speak, and sequestered themselves from social intercourse; for these, the busy have often preferred to the hurry and the din of life the calm retreats of contemplation; for these, when once they came to taste them, even the gay and voluptuous have thrown up the lawless pursuits of sense and appetite, and acknowledged these mental enjoyments to be the most refined, and indeed the only luxury. Besides, by a just and enlarged knowledge of nature, we recognise the perfections of its Author; and thus piety, and all those pious affections which depend on just sentiments of his character, are awakened and confirmed; whilst a thousand superstitious fears, which arise from partial views of his nature and works, will of course be excluded. An extensive prospect of human life, and of the periods and revolutions of human things, will conduce much to impart a certain greatness of mind, and a noble contempt of those little competitions about power, honour, and wealth, which disturb and divide the bulk of mankind; and promote a calm endurance of those inconveniences and evils which are the common appendages of humanity. Add to all this, that a just knowledge of human nature, and of those hinges upon which the business and fortunes of men turn, will prevent our thinking either too highly or too meanly of our fellow-creatures; give no small scope to the exercise of friendship, confidence, and good will; and at the same time brace the mind with a proper caution and distrust (those nerves of prudence), and give a greater mastery in the conduct of private as well as public life. By cultivating our intellectual abilities, therefore, we shall best promote and secure our interest, and be qualified for acting our part in society with more honour to ourselves, as well as advantage to mankind. It is consequently our duty to improve them to the utmost of our power; they are talents committed to us by the Almighty Head of society, and we are accountable to him for the use of them.

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The intellectual virtues are best improved by accurate and impartial observation, extensive reading, and unconfined converse with men of all characters, especially with those who to private study have joined the widest acquaintance with the world, and the greatest practice in affairs; but, above all, by being much in the world, and having large dealings with mankind. Such opportunities contribute much to divest one of prejudices and a servile attachment to crude systems, to open one's views, and to give that experience upon which the most useful because the most practical knowledge is built, and from which the surest maxims for the conduct of life are deduced.

Moral goods.

The highest goods which enter into the composition of human happiness are moral goods of the mind, directly and ultimately regarding ourselves; such as command of the appetites and passions, prudence and caution, magnanimity, fortitude, humility, love of virtue, love of God, resignation, and the like. These sublime goods are goods by way of eminence, goods recommended and enforced by the most intimate and awful sense and consciousness of our nature; goods which constitute the quintessence, the very temper, of happiness, and form that complexion of soul which renders us approveable and lovely in the sight of God; goods, in fine, which are the elements of all our future perfection and felicity.

Most of the other goods which we have considered depend partly upon ourselves, and partly on accidents which we can neither foresee nor prevent, and result from causes which we cannot influence or alter. They are such goods as we may possess to-day and lose to-morrow, and which require a felicity of constitution and talents to attain them in full vigour and perfection, and a felicity of conjunctures to secure the possession of them. Therefore, did our happiness depend altogether or chiefly on such transitory and precarious possessions, it were itself most precarious, and the highest folly, to be anxious about it. But although creatures constituted as we are cannot be indifferent about such goods, and must even suffer in some degree, and consequently have our happiness incomplete, without them, yet

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[1] *Philos. Sinic. Confuc.* lib. i. sect. 3, 4, &c.

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they weigh but little in the scale when compared with moral goods. By the benevolent constitution of our nature, the latter are placed within the sphere of our activity, so that no man can be destitute of them unless he is first wanting to himself. Some of the wisest and best of mankind have wanted most of the former goods, and all the external kind, and felt most of the opposite evils, such at least as arise from without; yet, by possessing the latter, viz. the moral goods, have declared they were happy, and to the conviction of the most impartial observers have appeared to be happy. The worst of men have been surrounded with every outward good and advantage of fortune, and have possessed great parts; yet, from want of moral rectitude, have been, and have confessed themselves to be, notoriously and exquisitely miserable. The exercise of virtue has supported its votaries, and made them exult in the midst of tortures almost intolerable; nay, how often has some false form or shadow of it sustained even the greatest villains and bigots under the same exigencies.[1] But no external goods, no goods of fortune, have been able to alleviate the agonies or expel the fears of a guilty mind, conscious of the deserved hatred and reproach of mankind, and the just displeasure of Almighty God.

The mixed condition of human life requires particular virtues.

As the present condition of human life is wonderfully chequered with good and evil, and as no height of station, no affluence of fortune, can absolutely insure the good, or secure against the evil, it is evident that a great part of the comfort and serenity of life must lie in having our minds duly affected with regard to both, that is, rightly attempered to the loss of one and the sufferance of the other. For it is certain that outward calamities derive their chief malignity and pressure from the inward dispositions with which we receive them. By managing these rightly, we may greatly abate that malignity and pressure, and consequently diminish the number and weaken the force of the evils of life, if we should not have it in our power to obtain a large share of its goods. There are particularly three virtues which go to the forming of this right temper towards evil, and which are of singular efficacy, if not totally to remove, yet wonderfully to alleviate, the calamities of life. These are fortitude or patience, humility, and resignation.

Fortitude is that calm and steady habit of mind which either moderates our fears, and enables us bravely to encounter the prospect of evil, or renders the mind serene and invincible under its immediate pressure. It lies equally distant from rashness and cowardice; and, though it does not hinder us from feeling, yet it prevents our complaining or shrinking under the stroke. It always includes a generous contempt of, or at least a noble superiority to, those precarious goods of which we can insure neither the possession nor the continuance. The man, therefore, who possesses this virtue in this ample sense of it, stands upon an eminence, and sees human things below him; the tempest indeed may reach him, but he stands secure and collected against it, upon the basis of conscious virtue, which the severest storms can seldom shake, and never overthrow.

Humility is another virtue of high rank and dignity, although often mistaken by proud mortals for meanness and pusillanimity. It is opposed to pride, which commonly includes in it a false or exaggerated estimation of our own merit, an ascription of it to ourselves as its only and original cause, an undue comparison of ourselves with others, and, in consequence of that supposed superiority, an arrogant preference of ourselves, and a supercilious contempt of them. Humility, on the other hand, seems to denote that modest and ingenuous temper of mind, which arises from a just and equal estimate of our own advantages compared with those of others, and from a sense of our deriving all originally from the Author of our being. Its ordinary attendants are mildness, a gentle forbearance, and an easy unassuming humanity with regard to the imperfections and faults of others; virtues rare, indeed, but of the fairest complexion, the proper offspring of so lovely a parent, the best ornaments of such imperfect creatures as we are, precious in the sight of God, and all-powerful over the hearts of men.

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Resignation is that mild and heroic temper of mind which arises from a sense of an infinitely wise and good providence, and enables us to acquiesce with cordial affection in its just appointments. This virtue has something very particular in its nature, as well as sublime in its efficacy; for it teaches us to bear evil, not only with patience, and as being unavoidable, but it transforms, as it were, evil into good, by leading us to consider it, and every event which has the least appearance of evil, as a divine dispensation, a wise and benevolent temperament of things, subservient to universal good, and of course including that of every individual, especially of such as calmly stoop to it. In this light, the administration itself, nay every act of it, becomes an object of affection, and the evil disappears, or is converted into a balm which both heals and nourishes the mind. For although the first unexpected access of evil may surprise the soul into grief, yet that grief, when the mind calmly reviews its object, changes into contentment, and is by degrees exalted into veneration and a divine composure. Our private will is lost in that of the Almighty, and our security against every real evil rests on the same bottom as the throne of him who lives and reigns for ever.

Chief good objective and formal.

Before we finish this section, it may be fit to observe, that as the Deity is the supreme and inexhaustible source of good, on whom the happiness of the whole creation depends; as he is the highest object in nature, and the only object who is fully proportioned to the intellectual and moral powers of the mind, in whom they ultimately rest, and find their most perfect exercise and completion; he is therefore termed the chief good of man, objectively considered. And virtue, or the proportioned and vigorous exercise of the several powers and affections towards their respective objects, as above described, is, in the schools, termed the chief good, formally considered, or its formal idea, being the inward temper and native constitution of human happiness.

Corollaries.

From the detail which we have thus gone through, the following important corollaries may be deduced:—1. It is evident that the happiness of such a progressive creature as man can never be at a stand, or continue a fixed invariable thing. His finite nature, let it rise ever so high, admits still higher degrees of improvement and perfection; and his progression in improvement or virtue always makes way for a progression in happiness: so that no possible point can be assigned in any period of his existence in which he is perfectly happy, that is, so happy as to exclude higher degrees of happiness. All his perfection is only comparative. 2. It appears that many things must conspire to complete the happiness of so various a creature as man, subject to so many wants, and susceptible of such different pleasures. 3. As his capacities of pleasure cannot be all gratified at the same time, and must often interfere with each other in such a precarious and fleeting state as human life, or be frequently disappointed, perfect happiness, that is, the undisturbed enjoyment of the several pleasures of which we are capable, is unattainable in our present state. 4. That state is most to be sought after, in which the fewest competitions and disappointments can happen, which least of all impairs any sense of

[1] As Ravaillac, who assassinated Henry IV. of France; and Balthasar Gerard, who murdered William I. prince of Orange.

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pleasure, and which opens an inexhaustible source of the most refined and lasting enjoyments. 5. That state which is attended with all these advantages, is a state or course of virtue; and therefore, a state of virtue, in which the moral goods of the mind are attained, is the happiest state.

CHAP. III.—DUTIES OF SOCIETY.

SECT. I.—*Filial and Fraternal Duty.*

As we have followed the order of nature in tracing the history of man, and those duties which he owes to himself, it seems reasonable to observe the same method respecting those he owes to society, which constitute the second class of his obligations.

Connection of parents.

His parents are amongst the earliest objects of his attention; he becomes soonest acquainted with them, reposes a peculiar confidence in them, and seems to regard them with a fond affection, the early prognostics of his future piety and gratitude. Thus does nature dictate the first lines of filial duty, even before a just sense of the connection is formed. But when the child is grown up, and has attained to such a degree of understanding as to comprehend the moral tie, and be sensible of the obligations he is under to his parents; when he looks back on their tender and disinterested affection, their incessant cares and labours in nursing, educating, and providing for him, during that state in which he had neither prudence nor strength to care and provide for himself; he must be conscious that he owes to them these peculiar duties.

Duties to parents.

To reverence and honour them, as the instruments of nature in introducing him to life, and to that state of comfort and happiness which he enjoys; and therefore to esteem and imitate their good qualities, to alleviate and bear with, and spread, as much as possible, a decent veil over their faults and weaknesses. To be highly grateful to them for those favours which it can hardly ever be in his power fully to repay: to show this gratitude by a strict attention to their wants, and a solicitous care to supply them; by a submissive deference to their authority and advice, especially by paying great regard to it in the choice of a wife, and of an occupation; by yielding to, rather than peevishly contending with, their humours, as remembering how often they have been persecuted by his; and, in fine, by soothing their cares, lightening their sorrows, supporting the infirmities of age, and making the remainder of their life as comfortable and joyful as possible.

Duties to brethren and sisters.

As his brethren and sisters are the next with whom the creature forms a social and moral connection, to them he owes a fraternal regard; and with them ought he to enter into a strict league of friendship, mutual sympathy, advice, assistance, and a generous intercourse of kind offices, remembering their relation to common parents, and that brotherhood of nature which unites them into a closer community of interest and affection.

SECT. II.—*Concerning Marriage.*

Connection with the other sex.

When man arrives at a certain age, he becomes sensible of a peculiar sympathy and tenderness towards the other sex; the charms of beauty engage his attention, and call forth new and softer dispositions than he has yet felt. The many amiable qualities exhibited by a fair outside, or by the mild allurement of female manners, or which the prejudiced spectator without much reasoning supposes those to include, with several other circumstances both natural and accidental, point his view and affection to a particular object, and of course contract that general rambling regard, which was lost and useless amongst the undistinguished crowd, into a peculiar and permanent attachment to one woman, which ordinarily terminates in the most important, venerable, and delightful connection in life. Duties of Society.

The state of the brute creation is very different from that of human creatures. The former are clothed and generally armed by their structure, easily find what is necessary to their subsistence, and soon attain their vigour and maturity; so that they need the care and aid of their parents but for a short while, and therefore we see that nature has assigned to them vagrant and transient amours. The connection being purely natural, and merely for propagating and rearing their offspring, no sooner is that end answered, than the connection dissolves of course. But the human race are of a more tender and defenceless constitution; their infancy and nonage continue longer; they advance slowly to strength of body and maturity of reason; they need constant attention, and a long series of cares and labours, in order to train them up to decency, virtue, and the various arts of life. Nature has, therefore, provided them with the most affectionate and anxious tutors, to aid their weakness, to supply their wants, and to accomplish them in those necessary arts, even their own parents, upon whom she has devolved this mighty charge, rendered agreeable by the most alluring and powerful of all ties, parental affection. But unless both concur in this grateful task, and continue their joint labours until they have reared up and planted out their young colony, it must become a prey to every rude invader, and the purpose of nature in the original union of the human pair must be defeated. Therefore our structure as well as condition is an evident indication that the human sexes are destined for a more intimate, that is, for a moral and lasting union. It appears, likewise, that the principal end of marriage is not to propagate and nurse up an offspring, but to educate and form minds for the great duties and extensive destinations of life. Society must be supplied from this original nursery with useful members, and its fairest ornaments and supports.

Moral ends of marriage.

The mind is apt to be dissipated in its views and acts of friendship and humanity, unless the former be directed to a particular object, and the latter employed in a particular province. When men once indulge in this dissipation, there is no stopping their career; they grow insensible to moral attractions; and, by obstructing or impairing the decent and regular exercise of the tender and generous feelings of the human heart, they in time become unqualified for, or averse to, the forming a moral union of souls, which is the cement of society, and the source of the purest domestic joys. But a rational and undepraved love, and its fair companion, marriage, collect a man's views, guide his heart to its proper object, and, by confining his affection to that object, do really enlarge its influence and use. Besides, it is but too evident, from the conduct of mankind, that the common ties of humanity are too feeble to engage and interest the passions of the generality in the affairs of society. The connections of neighbourhood, acquaintance, and general intercourse, are too wide a field of action for many, and those of a public or community are so for more; a field in which they either care not or know not how to exert themselves. Therefore nature, ever wise and benevolent, by implanting that strong sympathy which reigns between the individuals of each sex, and by urging them to form a particular moral connection, the spring of many domestic endearments, has measured out to each pair a particular sphere of action, proportioned to their views, and adapted to their respective capacities. Besides, by interesting them deeply in the concerns of their own little circle, she has connected them more closely with society, which is composed of particular families, and bound them down to their good behaviour in that particular community to which they belong.

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This moral connection is marriage, and this sphere of action is a family.

Of the conjugal alliance the following are the natural laws. First, mutual fidelity to the marriage-bed. Disloyalty defeats the very end of marriage; dissolves the natural cement of the relation; weakens the moral tie, the chief strength of which consists in the reciprocation of affection; and, by making the offspring uncertain, diminishes the care and attachment necessary to their education. Secondly, a conspiration of counsels and endeavours to promote the common interest of the family, and to educate their common offspring. In order to observe these laws, it is necessary to cultivate, both before and during the married state, the strictest decency and chastity of manners, and a just sense of what becomes their respective characters. Thirdly, the union must be inviolable, and for life. The nature of friendship, and particularly of this species of it, the education of their offspring, and the order of society and of successions, which would otherwise be extremely perplexed, all equally require this. To preserve the union in question, and render the matrimonial state more harmonious and comfortable, a mutual esteem and tenderness, a mutual deference and forbearance, a communication of advice, and assistance, and authority, are absolutely necessary. If both parties keep within their proper departments, there need be no disputes about power or superiority, and there will be none. They have no opposite, no separate interests, and therefore there can be no just ground for opposition of conduct.

Polygamy.

From this detail, and the present state of things, in which there is pretty nearly a parity of numbers of both sexes, it is evident that polygamy is an unnatural state; and though it should be granted to be more fruitful of children, which, however, it is not found to be, yet it is by no means so fit for rearing minds; which seems to be as much, if not more, the intention of nature than the propagation of bodies.

Sect. III.—*Of Parental Duty.*

Connection of parents and children.

The connection of parents with their children is a natural consequence of the matrimonial connection; and the duties which the parents owe them result as naturally from that connection. The feeble state of children, subject to so many wants and dangers, requires their incessant care and attention; their ignorant and uncultivated minds demand continual instruction and culture. Had human creatures come into the world with the full strength of men, but the weakness of reason and the vehemence of passions which prevail in children, they would have been too strong or too stubborn to submit to the government and instruction of their parents. But as they were designed for a progression in knowledge and virtue, it was proper that the growth of their bodies should keep pace with that of their minds, lest the purposes of this progression should have been defeated. Amongst other admirable purposes which this gradual expansion of their outward as well as inward structure serves, this is one: that it affords ample scope for the exercise of many tender and generous affections, which fill up the domestic life with a beautiful variety of duties and enjoyments, and are of course a noble discipline for the heart, and a hardy kind of education for the more honourable and important duties of public life.

The authority founded on that connection.

The above-mentioned weak and ignorant state of children seems plainly to invest their parents with such authority and power as is necessary to their support, protection, and education; but such authority and power cannot be construed to extend farther than is necessary to answer those ends, nor to last longer than that weakness and ignorance continue; wherefore, the foundation or reason of the authority and power having ceased, they cease of course. Whatever power or authority, then, it may be necessary or lawful for parents to exercise during the nonage of their children, to assume or usurp the same when they have attained the maturity or full exercise of their strength and reason would be tyrannical and unjust. Hence it is evident, that parents have no right to punish the persons of their children more severely than the nature of their wardship requires, much less to invade their lives, to encroach upon their liberty, or to transfer them as their property to any master whatsoever.

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Duties of parents.

The first class of duties which parents owe to their children respect their natural life; and these comprehend protection, nurture, provision, introducing them into the world in a manner suitable to their rank and fortune, and the like. The second order of duties regards the intellectual and moral life of their children, or their education in such arts and accomplishments as are necessary to qualify them for performing the duties they owe to themselves and to others. As this was found to be the principal design of the matrimonial alliance, so the fulfilling that design is the most important and dignified of all the parental duties. In order, therefore, to fit the child for acting his part wisely and worthily as a man, as a citizen, and as a creature of God, both parents ought to combine their joint wisdom, authority, and power, and each apart should employ those talents which are the peculiar excellency and ornament of their respective sex. The father ought to lay out and superintend their education, the mother should execute and manage the detail of which she is capable. The former should direct the manly exertion of the intellectual and the moral powers of his child. His imagination, and the manner of those exertions, are the peculiar province of the latter. The former should advise, protect, command, and, by his experience, masculine vigour, and that superior authority which is commonly ascribed to his sex, brace and strengthen his pupil for active life, for gravity, integrity, and firmness in suffering. The business of the latter is to bend and soften her male pupil, by the charms of her conversation, and the softness and decency of her manners, for social life, for politeness of taste, and the elegant decorums and enjoyments of humanity; and to improve and refine the tenderness and modesty of her female pupil, and form her for all those mild domestic virtues which are the peculiar characteristics and ornaments of her sex. To conduct the opening minds of their sweet charge through the several periods of their progress; to assist them in each period, in throwing out the latent seeds of reason and ingenuity, and in gaining fresh accessions of light and virtue; and at length, with all these advantages, to produce the young adventurers upon the great theatre of human life, to play their several parts in the sight of their friends, of society, and mankind; are equally incumbent on both

Sect. IV.—*Herile and Servile Duty.*

The ground of this connection.

In the natural course of human affairs, it must necessarily happen that some of mankind will live in plenty and opulence, and others be reduced to a state of indigence and poverty. The former need the labours of the latter, and the latter provision and support from the former. This mutual necessity is the foundation of that connection, whether we call it *moral* or *civil*, which subsists between masters and servants. He who feeds another has a right to some equivalent, viz. the labour of him whom he maintains, and the fruits of it; and he who labours for another has a right to expect that he should support him. But as the labours of a man of ordinary strength are certainly of greater value than mere food and clothing, because they would actually produce more, even the maintenance of a family, were the labourer to employ them in his own be-

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half, therefore he has an undoubted right to rate and dispose of his service for certain wages above mere maintenance; and if he have incautiously disposed of it for the latter only, yet the contract being of the onerous kind, he may equitably claim a supply of that deficiency. If the service be specified, the servant is bound to that only; if not, then he is to be construed as bound only to such services as are consistent with the laws of justice and humanity. By the voluntary servitude to which he subjects himself, he forfeits no rights but such as are necessarily included in that servitude, and is obnoxious to no punishment but such as a voluntary failure in the service may be supposed reasonably to require. The offspring of such servants have a right to that liberty which neither they nor their parents have forfeited.

As to those who, by reason of some heinous offence, or for some notorious damage, which they cannot otherwise compensate, are condemned to perpetual service, they do not, on that account, forfeit all the rights of men, but only those the loss of which is necessary to secure society against the like offences for the future, or to repair the damage which they have done.

With regard to captives taken in war, it is barbarous and inhuman to reduce them to perpetual slavery, unless some peculiar and aggravated circumstances of guilt have attended their hostility. The bulk of the subjects of any government engaged in war may be fairly esteemed innocent enemies, and therefore they have a right to that clemency which is consistent with the common safety of mankind, and the particular security of that society against which they are engaged. Though ordinary captives have a grant of their lives, yet to pay their liberty as an equivalent is much too high a price. There are other ways of acknowledging or returning the favour than by surrendering that which is far dearer than life itself.[1] To those who, under pretext of the necessities of commerce, drive the unnatural trade of bargaining for human flesh, and consigning their innocent but unfortunate fellow-creatures to eternal servitude and misery, we may address the words of a fine writer: "Let avarice defend it as it will, there is an honest reluctance in humanity against buying and selling, and regarding those of our own species as our wealth and possessions."

Sect. V.—*Social Duties of the Private Kind.*

Hitherto we have considered only the domestic economical duties, because these are first in the progress of nature. But as man passes beyond the little circle of a family, he forms connections with relations, friends, neighbours, and others; whence results a new train of duties of the more private social kind, as friendship, chastity, courtesy, good neighbourhood, charity, forgiveness, hospitality.

Man's aptitude for society.

Man is admirably formed for particular social attachments and duties. There is a peculiar and strong propensity in his nature to be affected with the sentiments and dispositions of others. Men, like certain musical instruments, are set to each other, so that the vibrations or notes excited in one raise correspondent notes and vibrations in the others. The impulses of pleasure or pain, joy or sorrow, made upon one mind, are by an instantaneous sympathy of nature communicated in some degree to all, especially when hearts are, as a humane writer expresses it, in unison of kindness; the joy that vibrates in one communicates to the other also. We may add, that although joy thus imparted swells the harmony, yet grief vibrated to the heart of a friend, and rebounding from thence in sympathetic notes, melts, as it were, and almost dies away. All the passions, but especially those of the social kind, are contagious; and when the passions of one man mingle with those of another, they increase and multiply prodigiously. There is a most moving eloquence in the human countenance, air, voice, and gesture, wonderfully expressive of the most latent feelings and passions of the soul, which darts them like a subtile flame into the hearts of others, and there raises correspondent feelings. Friendship, love, good humour, joy, spread through every feature, and particularly shoot from the eyes their softer and fiercer fires with an irresistible energy; and, in like manner, the opposite passions of hatred, enmity, ill humour, melancholy, diffuse a sullen and saddening air over the face, and, flashing from eye to eye, kindle a train of similar passions. By these, and other admirable pieces of machinery, men are formed for society and the delightful interchange of friendly sentiments and duties, to increase the happiness of others by participation, and their own by rebound; and to diminish, by dividing, the common stock of their misery.

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Duties arising from private relation.

The first emanations of the social principle beyond the bounds of a family lead us to form a nearer conjunction of friendship or good will with those who are anywise connected with us by blood or domestic alliance. To them our affection does commonly exert itself in a greater or less degree, according to the nearness or distance of the relation. And this proportion is admirably suited to the extent of our powers and the indigence of our state; for it is only within those lesser circles of consanguinity or alliance that the generality of mankind are able to display their abilities or benevolence, and consequently to uphold their connection with society, and subserviency to a public interest. Therefore it is our duty to regard these closer connections as the next department to that of a family, in which nature has marked out for us a sphere of activity and usefulness; and to cultivate the kind affections which are the cement of these endearing alliances.

Ingredients of friendship.

Frequently the view of distinguishing moral qualities in some of our acquaintance may give birth to that more noble connection which we call *friendship*, which is far superior to the alliances of consanguinity. For these are of a superficial, and often of a transitory nature, of which, as they hold more of instinct than of reason, we cannot give such a rational account. But friendship derives all its strength and beauty, and the only existence which is durable, from the qualities of the heart, or from virtuous and lovely dispositions; or should these be wanting, they or some shadow of them must be supposed present. Therefore friendship may be described to be the union of two souls by means of virtue, the common object and cement of their mutual affection. Without virtue, or the supposition of it, friendship is only a mercenary league, an alliance of interest, which must dissolve of course when that interest decays or subsists no longer. It is not so much any particular passion, as a composition of some of the noblest feelings and passions of the mind. Good sense, a just taste and love of virtue, a thorough candour and benignity of heart, or what we usually call a good temper, and a generous sympathy of sentiments and affections, are the necessary ingredients of this virtuous connection. When it is grafted on esteem, strengthened by habit, and mellowed by time, it yields infinite pleasure, ever new and ever growing; is a noble support amidst the various trials and vicissitudes of life; and constitutes a high seasoning to most of our other enjoyments. To form and cultivate virtuous friendship, must be very improving to the temper, as its principal object is virtue, set off with all the allurement of

[1] Hutcheson, Mor. Inst. Phil. lib. iii. c. 3.

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countenance, air, and manners, shining forth in the native graces of manly honest sentiments and affections, and rendered visible as it were to the friendly spectator in a conduct unaffectedly great and good; and as its principal exercises are the very energies of virtue, or its effect and emanations, so, wherever this amiable attachment prevails, it will exalt our admiration and attachment to virtue, and, unless impeded in its course by unnatural prejudices, will run out into a friendship to the human race. For as no one can merit, and no one ought to usurp, the sacred name of friend, who hates mankind; so, whoever truly loves them, possesses the most essential quality of a true friend.

The duties of friendship are a mutual esteem of each other, unbribed by interest, and independent of it; a generous confidence, as far distant from suspicion as from reserve; an inviolable harmony of sentiments and dispositions, of designs and interests; a fidelity unshaken by the changes of fortune; a constancy unalterable by distance of time or place; a resignation of one's personal interest to those of one's friend; and a reciprocal, unenvious, unreserved exchange of kind offices. But, amidst all the exertions of this moral connection, humane and generous as it is, we must remember that it operates within a narrow sphere, and its immediate operations respect only the individual; and therefore its particular impulses must still be subordinate to a more public interest, or be always directed and controlled by the more extensive connections of our nature.

Love and chastity.

When our friendship terminates on any of the other sex, in whom beauty or agreeableness of person and external gracefulness of manners conspire to express and heighten the moral charm of a tender honest heart, and sweet, ingenuous, modest temper, lighted up by good sense, it generally grows into a more soft and endearing attachment. When this attachment is improved by a growing acquaintance with the worth of its object, is conducted by discretion, and issues at length, as it ought to do, in the moral connection formerly mentioned, it becomes the source of many amiable duties, of a communication of passions and interests, of the most refined decencies, and of a thousand nameless, deep-felt joys of reciprocal tenderness and love, flowing from every look, word, and action. Here friendship acts with double energy, and the natural conspire with the moral charms to strengthen and secure the love of virtue. As the delicate nature of female honour and decorum, and the inexpressible grace of a chaste and modest behaviour, are the surest and indeed the only means of kindling at first, and ever afterwards keeping alive, this tender and elegant flame, and accomplishing the excellent ends designed by it; to attempt by fraud to violate the one, or, under pretence of passion, to sully and corrupt the other, and, by so doing, to expose the too often credulous and unguarded object, with a wanton cruelty, to the hatred of her own sex and the scorn of ours, and to the lowest infamy of both, is a conduct not only base and criminal, but inconsistent with that truly rational and refined enjoyment, the spirit and quintessence of which are derived from the bashful and sacred charms of virtue kept untainted, and therefore ever alluring to the lover's heart.

Courtesy, good neighbourhood, &c.

Courtesy, good neighbourhood, affability, and the like duties, which are founded upon our private social connections, are no less necessary and obligatory on creatures united to society, and supporting and supported by each other in a chain of mutual want and dependence. They do not consist in a smooth address, an artificial or obsequious air, fawning adulations, or a polite servility of manners, but in a just and modest sense of our own dignity and that of others, and of the reverence due to mankind, especially to those who hold the higher links of the social chain; in a discreet and manly accommodation of ourselves to the foibles and humours of others; in a strict observance of the rules of decorum and civility; but, above all, in a frank obliging carriage, and a generous interchange of good deeds rather than words. Such a conduct is of great use and advantage, as it is an excellent security against injury, and the best claim and recommendation to the esteem, civility, and universal respect of mankind. This inferior order of virtues unites the particular members of society more closely, and forms the lesser pillars of the civil fabric; which, in many instances, supply the unavoidable defects of laws, and maintain the harmony and decorum of social intercourse, where the more important and essential lines of virtue are wanting.

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Charity, forgiveness.

Charity and forgiveness are truly amiable and useful duties of the social kind. There is a twofold distinction of rights commonly taken notice of by moral writers, namely, perfect and imperfect. To fulfil the former is necessary to the being and support of society; to fulfil the latter is a duty equally sacred and obligatory, and tends to the improvement and prosperity of society; but as the violation of them is not equally prejudicial to the public good, the fulfilling of them is not subjected to the cognizance of law, but left to the candour, humanity, and gratitude of individuals. By this means ample scope is afforded to exercise all the generosity, and display the genuine merit and lustre, of virtue. Thus the wants and misfortunes of others call for our charitable assistance and seasonable supplies. And the good man, unconstrained by law, and uncontrolled by human authority, will cheerfully acknowledge and generously satisfy this mournful and moving claim: a claim supported by the sanction of heaven, of whose bounties he is honoured to be the grateful trustee. If his own perfect rights are invaded by the injustice of others, he will not therefore reject their imperfect right to pity and forgiveness, unless his grant of these should be inconsistent with the more extensive rights of society, or the public good. In that case he will have recourse to public justice and the laws; and even then he will prosecute the injury with no unnecessary severity, but rather with mildness and humanity. When the injury is merely personal, and of such a nature as to admit of alleviations, and the forgiveness of which would be attended with no worse consequences, especially of a public kind, the good man will generously forgive his offending brother; and it is his duty to do so, rather than to take private revenge, or to retaliate evil for evil. For though resentment of injury is a natural passion, and implanted, as was observed above,[1] for wise and good ends, yet, considering the manifold partialities which most men have for themselves, were every one to act as judge in his own cause, and to execute the sentence dictated by his own resentment, it is but too evident that mankind would pass all bounds in their fury, and the last sufferer would be provoked in his turn to make full reprisals; so that evil, thus encountering with evil, would produce one continued series of violence and misery, and render society intolerable, if not impracticable. Therefore, where the security of the individual, or the good of the public, does not require a proportional retaliation, it is agreeable to the general law of benevolence, and to the particular end of the passion, which is to prevent injury and the misery occasioned by it, to forgive personal injuries, or not to return evil for evil. This duty is indeed one of the noble refinements which Christianity has made upon the general maxims and practice of mankind, and enforced, with a peculiar strength and beauty, by sanctions no less alluring than awful. And in-

[1] See part i. chap. 2 and 4.

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deed the practice of it is generally its own reward; by expelling from the mind the most dreadful intruders upon its repose, those rancorous passions which are begotten and nursed by resentment; and by disarming and even subduing every enemy one has, except such as have nothing left of men but the outward form.

Hospitality.

The most enlarged and humane connection of the private kind seems to be the hospitable alliance, from which flow the amiable and disinterested duties we owe to strangers. If the exercise of passions of the most private and instinctive kind is beheld with moral approbation and delight, how lovely and venerable must those appear which result from a calm philanthropy, are founded in the common rights and connections of society, and embrace men, not of a particular sect, party, or nation, but all in general, without distinction, and without any of the little partialities of self-love.

Sect. VI.—*Social Duties of the Commercial Kind.*

Commercial duties.

The next order or class of connections are those which arise from the wants and weakness of mankind, and from the various circumstances in which their different situations place them. These we may call *commercial* connections, and the duties which result from them *commercial* duties; as justice, fair-dealing, sincerity, fidelity to compacts, and the like.

Although nature is perfect in all her works, yet she has observed a manifest and eminent distinction amongst them. To all such as lie beyond the reach of human skill and power, and are properly of her own department, she has given the finishing hand. These man may afterwards design and imitate; but he can never rival them, nor add to their beauty or perfection. Such are the forms and structure of vegetables, animals, and many of their productions, as the honey-comb, the spider's web, and the like. There are others of her works which she has intentionally left unfinished, as it were, in order to exercise the ingenuity and power of man. She has presented to him a rich profusion of materials of every kind for his convenience and use; but they are rude and unpolished, or not to be come at without art and labour. These therefore he must needs apply, in order to adapt them to his use, and to enjoy them in perfection. Thus nature has given him an infinite variety of herbs, grains, fossils, minerals, woods, water, earth, air, and a thousand other crude materials, to supply his numerous wants; but he must sow, plant, dig, refine, polish, build, and, in short, manufacture the various produce of nature, in order to obtain even the necessaries, and much more the conveniencies and elegancies, of life. These, then, are the price of his labour and industry, and without that nature will sell him nothing. But as the wants of mankind are many, and the single strength of individuals small, they could hardly find the necessaries, and much less the conveniencies, of life, without uniting their ingenuity and their strength in acquiring these, and without a mutual intercourse of good offices. Some men are better formed for some kinds of ingenuity and labour, and others for other kinds; and different soils and climates are enriched with different productions; so that men, by exchanging the produce of their respective labours, and supplying the wants of one country with the superfluities of another, do in effect diminish the labours of each, and increase the abundance of all. This is the foundation of all commerce, or exchange of commodities and goods, one with another; in order to facilitate which, men have contrived different species of coin, or money, as a common standard by which to estimate the comparative values of their respective goods. But to render commerce sure and effectual, justice, fair-dealing, sincerity, and fidelity to compacts, are absolutely necessary.

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Justice.

Justice, or fair-dealing, or, in other words, a disposition to treat others as we would be treated by them, is a virtue of the first importance, and inseparable from the virtuous character. It is the cement of society, or that pervading spirit which connects its members, inspires its various relations, and maintains the order and subordination of each part of the whole. Without it society would become a den of thieves and banditti, hating and hated, devouring and devoured, by one another.

And here it may be proper to take a view of Mr Hume's supposed case of the sensible knave and the worthless miser, and consider what would be the duty of the former according to the theory of those moralists who hold the will of God to be the criterion or rule, and everlasting happiness the motive, of human virtue.

It has already been observed, and the truth of the observation cannot be controverted, that, by secretly purloining from the coffers of a miser, part of that gold which there lies useless, a man might in particular circumstances promote the good of society, without doing any injury to a single individual; and it was hence inferred, that, in such circumstances, it would be no duty to abstain from theft, were local utility, arising from particular consequences, the real criterion or standard of justice. Very different, however, is the conclusion which must be drawn by those who consider the natural tendency of actions, if universally performed, as the criterion of their merit or demerit in the sight of God. Such philosophers attend, not to the particular consequences of a single action in any given case, but to the general consequences of the principle from which it flows, if that principle were universally adopted. You cannot, say they, permit one action and prohibit another, without showing a difference between them. The same sort of actions, therefore, must be generally permitted or generally forbidden. But were every man allowed to ascertain for himself the circumstances in which the good of society would be promoted, by secretly abstracting the superfluous wealth of a worthless miser, it is plain that no property could be secure; that all incitements to industry would be at once removed; and that, whatever might be the immediate consequences of any particular theft, the general and necessary consequences of the principle by which it was authorized must soon prove fatal. Were one man to purloin part of the riches of a real miser, and to consider his conduct as vindicated by his intention to employ those riches in acts of generosity, another might, by the same sort of casuistry, think himself authorized to appropriate to himself part of his wealth; and thus theft would spread through all orders of men, till society were resolved into separate, hostile, and savage families, mutually dreading and shunning each other. The general consequences, therefore, of encroaching upon private property tend evidently and violently to universal misery.

On the other hand, indeed, the particular and immediate consequences of that principle which considers every man's property as sacred, may in some cases, such as that supposed, be in a small degree injurious to a few families in the neighbourhood of the miser and the knave. But that injury can never be of long duration; and it is infinitely more than counterbalanced by the general good consequences of the principle from which it accidentally results, since these consequences extend to all nations and to all ages. Without a sacred regard to property, there could neither be arts nor industry nor confidence amongst men, and happiness would be for ever banished from this world. But the communication of happiness being the end which God had in view when he created the world, and all men standing in the same relation to him, it is impossible to suppose that he does not approve, and will not ultimately reward, those voluntary actions of which the natural ten-

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dency is to increase the sum of human happiness; or that he does not disapprove, and will not ultimately punish, those which naturally tend to aggravate human misery. The conclusion is, that a strict adherence to the principle of justice is universally, and in all possible circumstances, a duty from which we cannot deviate without offending our Creator, and ultimately bringing misery upon ourselves.

Sincerity.

Sincerity, or veracity, in our words and actions, is another virtue or duty of great importance to society, being one of the great bands of mutual intercourse, and the foundation of mutual trust. Without it society would be the dominion of mistrust, jealousy, and fraud, and conversation a traffic of lies and dissimulation. It includes in it a conformity of our words with our sentiments, a correspondence between our actions and dispositions, a strict regard to truth, and an irreconcilable abhorrence of falsehood. It does not indeed require that we should expose our sentiments indiscreetly, or tell all the truth in every case; but certainly it does not and cannot admit the least violation of truth, or contradiction to our sentiments. For if these bounds are once passed, no possible limit can be assigned where the violation shall stop, and no pretence of private or public good can possibly counterbalance the ill consequences of such a violation.

Fidelity to promises and compacts.

Fidelity to promises, and compacts, and engagements, is likewise a duty of such importance to the security of commerce and interchange of benevolence amongst mankind, that society would soon grow intolerable without the strict observance of it. Hobbes, and others who follow the same track, have taken a wonderful deal of pains to puzzle this subject, and to make all the virtues of this sort merely artificial, and not at all obligatory, antecedent to human conventions. No doubt compacts suppose people who make them, and promises persons to whom they are made; and therefore both suppose some society, more or less, between those who enter into such mutual engagements. But is not a compact or promise binding, till men have agreed that they shall be binding? or are they only binding because it is our interest to be bound by them, or to fulfil them? Do not we highly approve the man who fulfils them, even though they should prove to be against his interest? and do not we condemn him as a knave who violates them on that account? A promise is a voluntary declaration by words, or by an action equally significant, of our resolution to do something in behalf of another, or for his service. When it is made, the person who makes it is by all supposed under an obligation to perform it; and he to whom it is made may demand the performance as his right. That perception of obligation is a simple idea, and is on the same footing as our other moral perceptions, which may be described by instances, but cannot be defined. Whether we have a perception of such obligation quite distinct from the interest, either public or private, that may accompany the fulfilment of it, must be referred to the conscience of every individual; and whether the mere sense of that obligation, apart from its concomitants, is not a sufficient inducement or motive to keep one's promise, without having recourse to any selfish principle of our nature, must likewise be appealed to the conscience of every honest man.

It may, however, be not improper to remark, that in this, as in all other instances, our chief good is combined with our duty. Men act from expectation. Expectation is in most cases determined by the assurances and engagements which we receive from others. If no dependence could be placed upon these assurances, it would be altogether impossible to know what judgment to form of many future events, or how to regulate our conduct with respect to them. Confidence, therefore, in promises is essential to the intercourse of human life, because without it the greatest part of our conduct would proceed upon chance. But there could be no confidence in promises, if men were not obliged to perform them. Those, therefore, who allow not to the perceptions of the moral sense all that authority which we attribute to them, must still admit the obligation to perform promises, because such performance may be shown to be agreeable to the will of God, in the very same manner in which, upon their principles, we have shown the uniform practice of justice to be so. Duties of Society.

Fair-dealing and fidelity to compacts require that we should take no advantage of the ignorance, passion, or incapacity of others, from whatever cause these defects may arise; that we should be explicit and candid in making bargains, just and faithful in fulfilling our part of them. And if the other party violates his engagements, redress is to be sought from the laws, or from those who are intrusted with the execution of them. In fine, the commercial virtues and duties require that we not only do not invade, but maintain the rights of others; that we be fair and impartial in transferring, bartering, or exchanging property, whether in goods or service; and be inviolably faithful to our word and our engagements, where the matter of them is not criminal, and where they are not extorted by force.

Sect. VII.—*Social Duties of the Political Kind.*

We have now arrived at the last and highest order of duties respecting society, which result from the exercise of the most generous and heroic affections, and are founded on our most enlarged connections.

Political connections.

The social principle in man is of such an expansive nature, that it cannot be confined within the circuit of a family, of friends, or of a neighbourhood; it spreads into wider systems, and draws men into larger confederacies, communities, and commonwealths. It is in those only that the higher powers of our nature attain the greatest improvement and perfection of which they are capable. These principles hardly find objects in the solitary state of nature. There the principle of action rises no higher than natural affection towards one's offspring. There personal or family wants entirely engross the creature's attention and labour, and allow no leisure, or, if they do, no exercise, for views and affections of a more enlarged kind. In solitude all are employed in the same way, in providing for the animal life. And even after their utmost labour and care, single and unaided by the industry of others, they find but a sorry supply of their wants, and a feeble, precarious security against dangers from wild beasts; from inclement skies and seasons; from the mistakes or petulant passions of their fellow-creatures; from their preference of themselves to their neighbours; and from all the little exorbitancies of self-love. But in society, the mutual aids which men give and receive shorten the labours of each, and the combined strength and reason of individuals give security and protection to the whole body. There is both a variety and subordination of genius amongst mankind. Some are formed to lead and direct others; to contrive plans of happiness for individuals, and of government for communities; to take in a public interest, invent laws and arts, and superintend their execution; and, in short, to refine and civilize human life. Others, who have not such good heads, may have as honest hearts, a truly public spirit, love of liberty, hatred of corruption and tyranny, a generous submission to laws, order, and public institutions, and an extensive philanthropy; and others, who have none of those capacities either of heart or head, may be well formed for manual exercise and bodily labour. The former of these principles have no scope in solitude, where a man's thoughts and concerns do all either centre in himself or extend no farther than a family, into which

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little circle all the duty and virtue of the solitary mortal is crowded. But society finds proper objects and exercises for every genius, and the noblest objects and exercises for the noblest geniuses, and for the highest principles in the human constitution; particularly for that warmest and most divine passion which God has kindled in our bosoms, the inclination of doing good, and reverencing our nature, which may find here both employment and the most exquisite satisfaction. In society, a man has not only more leisure, but better opportunities of applying his talents with much greater perfection and success, especially as he is furnished with the joint advice and assistance of his fellow-creatures, who are now more closely united one with the other, and sustain a common relation to the same moral system or community. This, then, is an object proportioned to his most enlarged social affections; and in serving it he finds scope for the exercise and refinement of his highest intellectual and moral powers. Therefore society, or a state of civil government, rests on these two principal pillars, that in it we find security against those evils which are unavoidable in solitude; and obtain those goods, some of which cannot be obtained at all, and others not so well, in that state where men depend solely on their individual sagacity and industry.

From this short detail it appears, that man is a social creature, and formed for a social state; and that society, being adapted to the higher principles and destinations of his nature, must of necessity be his natural state.

Political duties.

The duties suited to that state, and resulting from those principles and destinations, or, in other words, from our social passions and social connections, or relation to a public system, are, love of our country, resignation and obedience to the laws, public spirit, love of liberty, sacrifice of life and all to the public, and the like.

Love of one's country.

Love of our country is one of the noblest passions that can warm and animate the human breast. It includes all the limited and particular affections to our parents, friends, neighbours, fellow-citizens, countrymen. It ought to direct and limit our more confined and partial actions within their proper and natural bounds, and never let them encroach upon those sacred and first regards we owe to the great public to which we belong. Were we solitary creatures, detached from the rest of mankind, and without any capacity of comprehending a public interest, or without affections leading us to desire and pursue it, it would not be our duty to mind it, nor criminal to neglect it. But as we are *parts* of the public system, and are not only capable of taking in large views of its interests, but by the strongest affections connected with it, and prompted to take a share of its concerns, we are under the most sacred ties to prosecute its security and welfare with the utmost ardour, especially in times of public trial. This love of our country does not import an attachment to any particular soil, climate, or spot of earth, where perhaps we first drew our breath, though those natural ideas are often associated with the moral ones, and, like external signs or symbols, help to ascertain and bind them; but it imports an affection to that moral system or community, which is governed by the same laws and magistrates, and whose several parts are variously connected one with the other, and all united upon the foundation of a common interest. Perhaps indeed every member of the community cannot comprehend so large an object, especially if it extends through large provinces, and over vast tracts of land; and still less can he form such an idea, if there is no public, that is, if all are subject to the caprice and unlimited will of one man; but the preference the generality show to their native country, the concern and longing after it which they express when they have been long absent from it; the labours they undertake and the sufferings they endure to save or serve it, and the peculiar attachment they have to their countrymen; evidently demonstrate that the passion is natural, and never fails to exert itself when it is fairly disengaged from foreign clogs, and is directed to its proper object. Wherever it prevails in its genuine vigour and extent, it swallows up all sordid and selfish regards; it conquers the love of ease, power, pleasure, and wealth; nay, when the amiable partialities of friendship, gratitude, private affection, or regards to a family, come in competition with it, it will teach us bravely to sacrifice all, in order to maintain the rights, and promote or defend the honour and happiness, of our country.

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Resignation and obedience to the laws.

Resignation and obedience to the laws and orders of the society to which we belong are political duties necessary to its very being and security, without which it must soon degenerate into a state of licentiousness and anarchy. The welfare, nay, the nature of civil society, requires that there should be a subordination of orders, or diversity of ranks and conditions in it; that certain men, or orders of men, should be appointed to superintend and manage such affairs as concern the public safety and happiness; that all have their particular provinces assigned them; that such a subordination be settled among them as that none of them may interfere with another; and finally, that certain rules or common measures of action be agreed on, by which each is bound to discharge his respective duty to govern or be governed, and all may concur in securing the order, and promoting the felicity, of the whole political body. Those rules of action are the laws of the community; and those different orders are the several officers or magistrates appointed by the public to explain them, and superintend or assist in their execution. In consequence of this settlement of things, it is the duty of each individual to obey the laws enacted; to submit to the executors of them with all due deference and homage, according to their respective ranks and dignity, as to the keepers of the public peace, and the guardians of public liberty; to maintain his own rank, and perform the functions of his own station, with diligence, fidelity, and incorruption. The superiority of the higher orders, or the authority with which the state has invested them, entitle them, especially if they employ their authority well, to the obedience and submission of the lower, and to a proportional honour and respect from all. The subordination of the lower ranks claims protection, defence, and security from the higher; and the laws, being superior to all, require the obedience and submission of all, being the last resort, beyond which there is no decision or appeal.

Foundation of public spirit, love of liberty, &c.

Public spirit, heroic zeal, love of liberty, and the other political duties, do, above all others, recommend those who practise them to the admiration and homage of mankind; because, as they are the offspring of the noblest minds, so are they the parents of the greatest blessing to society. Yet, exalted as they are, it is only in equal and free governments where they can be exercised and have their due effect; for there only does a true public spirit prevail, and there only is the public good made the standard of the civil constitution. As the end of society is the common interest and welfare of the people associated, this end must of necessity be the supreme law or common standard by which the particular rules of action of the several members of the society towards each other are to be regulated. But a common interest can be no other than that which is the result of the common reason or common feelings of all. Private men, or a particular order of men, have interests and feelings peculiar to themselves, and of which they may be good judges; but these may be separate from, and often contrary to, the interests and feelings of the rest of the society, and therefore they can have no right to make, and much less to impose, laws on their fellow-citizens, inconsistent with, and opposite to, those interests and those feelings. Therefore, a society, a government, or real public, truly worthy the name, and not a confederacy of ban-

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ditti, a clan of lawless savages, or a band of slaves under the whip of a master, must be such a one as consists of freemen, choosing or consenting to laws themselves; or, since it often happens that they cannot assemble and act in a collective body, delegating a sufficient number of representatives, that is, such a number as shall most fully comprehend, and most equally represent, their common feelings and common interests, to digest and vote laws for the conduct and control of the whole body, the most agreeable to those common feelings and common interests.

Political duties of every citizen.

A society which is thus constituted by common reason, and formed on the plan of a common interest, becomes immediately an object of public attention, public veneration, public obedience, a public and inviolable attachment, which ought neither to be seduced by bribes, nor awed by terrors; an object, in fine, of all those extensive and important duties which arise from so glorious a confederacy. To watch over such a system; to contribute all he can to promote its good, by his reason, his ingenuity, his strength, and every other ability, whether natural or acquired; to resist, and, to the utmost of his power, to defeat every encroachment upon it, whether carried on by a secret corruption or open violence; and to sacrifice his ease, his wealth, his power, nay, life itself, and, what is dearer still, his family and friends, to defend or save it, is the duty, the honour, the interest, and the happiness of every citizen. It will make him venerable and beloved whilst he lives, be lamented and honoured if he falls in so glorious a cause, and transmit his name with immortal renown to the latest posterity.

As the *people* are the fountain of all power and authority, the original seat of majesty, the authors of laws, and the creators of officers to execute them; if they shall find the power they have conferred abused by their trustees, their majesty violated by tyranny or by usurpation, their authority prostituted to support violence or screen corruption, the laws grown pernicious through accidents unforeseen or unavoidable, or rendered ineffectual through the infidelity and corruption of the executors of them; then it is their right, and what is their right is their duty, to resume that delegated power, and call their trustees to an account; to resist the usurpation, and extirpate the tyranny; to restore their sullied majesty and prostituted authority; to suspend, alter, or abrogate those laws, and to punish their unfaithful and corrupt officers. Nor is this the duty only of the united body; but every member of it ought, according to his respective rank, power, and weight in the community, to concur in advancing and supporting these glorious designs.

Resistance, therefore, being undoubtedly lawful in extraordinary emergencies, the question, amongst good reasoners, can only be with regard to the degree of necessity which can justify resistance, and render it expedient or commendable. And here we must acknowledge, that, with Mr Hume, we shall always incline to their side who draw the bond of allegiance very close, and who consider an infringement of it as the last refuge in desperate cases, when the public is in the highest danger from violence and tyranny. "For, besides the mischiefs of a civil war, which commonly attends insurrection, it is certain, that where a disposition to rebellion appears among any people, it is one chief cause of tyranny in the rulers, and forces them into many violent measures, which, had every one been inclined to submission and obedience, they would never have embraced. Thus the *tyrannicide*, or assassination approved of by ancient maxims, instead of keeping tyrants and usurpers in awe, made them ten times more fierce and unrelenting; and is now justly abolished on that account by the laws of nations, and universally condemned, as a base and treacherous method of bringing to justice those disturbers of society."

CHAP. IV.—DUTY TO GOD.

Duty to God.

Divine connections.

Of all the relations which the human mind sustains, that which subsists between the Creator and his creatures, the Supreme Lawgiver and his subjects, is the highest and the best. This relation arises from the nature of a creature in general, and the constitution of the human mind in particular; the noblest powers and affections of which point to an universal mind, and would be imperfect and abortive without such a direction. How lame, then, must that system of morals be, which leaves a Deity out of the question; how disconsolate, and how destitute of its firmest support.

Existence of God, and his relation to the human mind.

It does not appear, from the history or experience of the mind's progress, that any man, by any formal deduction of his discursive power, ever reasoned himself into the belief of a God. Whether such a belief is only some natural anticipation of soul, or is derived from father to son, and from one man to another, in the way of tradition, or is suggested to us in consequence of an immutable law of nature, on beholding the august aspect and beautiful order of the universe, we shall not pretend to determine. What seems most agreeable to experience is, that a sense of its beauty and grandeur, and the admirable fitness of one thing to another in its vast apparatus, leads the mind necessarily and unavoidably to a perception of a design, or of a designing cause, the origin of all, by a progress as simple and natural as that by which a beautiful picture or a fine building suggests to us the idea of an excellent artist. For it seems to hold universally true, that wherever we discern a tendency or co-operation of things towards a certain end, or producing a common effect, there, by a necessary law of association, we apprehend design, and a designing energy or cause. No matter whether the objects are natural or artificial, still that suggestion is unavoidable, and the connection between the effect and its adequate cause obtrudes itself on the mind, and it requires no nice search or elaborate deduction of reason to trace or prove that connection. We are particularly satisfied of its truth in the subject before us by a kind of direct intuition; and we do not seem to attend to the maxim we learn in schools, that there cannot be an infinite series of causes and effects, producing and produced by one another. That maxim is familiar only to metaphysicians; but all men of sound understanding are led to believe the existence of a God. We are conscious of our existence, of thought, sentiment, and passion, and sensible withal that these came not of ourselves; therefore we immediately recognise a parent mind, an original intelligence, from whom we borrowed those little portions of thought and activity. And whilst we not only feel kind affections in ourselves, and discover them in others, but likewise behold around us such a number and variety of creatures, endowed with natures nicely adjusted to their several stations and economies, supporting and supported by each other, and all sustained by a common order of things, and sharing different degrees of happiness according to their respective capacities, we are naturally and necessarily led up to the Father of such a numerous offspring, the fountain of such wide-spread happiness. As we conceive this Being before all, above all, and greater than all, we naturally, and without reasoning, ascribe to him every kind of perfection, wisdom, power, and goodness without bounds, existing through all time, and pervading all space. We apply to him those glorious epithets of our Creator, Preserver, Benefactor, the Supreme Lord and Lawgiver of the whole society of rational and intelligent creatures. Not only the imperfections and wants of our being and condition, but some of the noblest instincts and affections of our minds, connect us with this great and universal nature. The mind, in its progress from object to object, from one character and prospect of

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beauty to another, finds some blemish or deficiency in each, and soon exhausts or grows weary and dissatisfied with its subject; it sees no character of excellence amongst men equal to that pitch of esteem which it is capable of exerting; no object within the compass of human things adequate to the strength of its affection; nor can it stay anywhere in this self-expansive progress, or find repose after its highest flights, till it arrives at a Being of unbounded greatness and worth, on whom it may employ its most sublime powers without exhausting the subject, and give scope to the utmost force and fulness of its love without satiety or disgust. It follows that the nature of this Being corresponds to the nature of man; nor can his intelligent and moral powers obtain their entire end, but on the supposition of such a Being, and without a real sympathy and communication with him. The native propensity of the mind to reverence whatever is great and wonderful in nature, finds a proper object of homage in him who spread out the heavens and the earth, and who sustains and governs the whole. The admiration of beauty, the love of order, and the complacency we feel in goodness, must rise to the highest pitch, and attain the full vigour and joy of their operations, when they unite in him who is the sum and source of all perfection.

Immorality of impiety.

It is evident, from the slightest survey of morals, that how punctual soever one may be in performing the duties which result from our relations to mankind, yet to be quite deficient in performing those which arise from our relation to the Almighty, must argue a strange perversion of reason or depravity of heart. If imperfect degrees of worth attract our veneration, and if the want of it would imply an insensibility, or, which is worse, an aversion to merit, what lameness of affection or immorality of character must it be to be unaffected with, and, much more, to be ill affected to, a Being of superlative worth. To love society, or particular members of it, and yet to have no sense of our connection with its Head, no affection to our common Parent and Benefactor; to be concerned about the approbation or censure of our fellow-creatures, and yet to feel nothing of this kind towards him who sees and weighs our actions with unerring wisdom and justice, and can fully reward or punish them, betrays equal madness and partiality of mind. It is plain, therefore, beyond all doubt, that some regards are due to the great Father of all, in whom every lovely and adorable quality combines to inspire veneration and homage.

Right opinions of God.

As it has been observed already that our affections depend on our opinions of their objects, and generally keep pace with them, it must be of the highest importance, and seems to be amongst the first duties we owe to the Author of our being, to form the least imperfect, since we cannot form perfect, conceptions of his character and administration. For such conceptions, thoroughly imbibed, will render our religion rational, and our dispositions refined. If our opinions are diminutive and distorted, our religion will be superstitious, and our temper abject. Thus, if we ascribe to the Deity that false majesty which consists in the unbenevolent and sullen exercise of mere will or power, or suppose him to delight in the prostrations of servile fear, or as servile praise, he will be worshipped with mean adulation and a profusion of compliments. Again, if he be looked upon as a stern and implacable Being, delighting in vengeance, he will be adored with pompous offerings, sacrifices, or whatever else may be thought proper to soothe and mollify him. But if we believe perfect goodness to be the character of the Supreme Being, and that he loves those most who resemble him most, the worship paid him will be rational and sublime, and his worshippers will seek to please him by imitating that goodness which they adore. The foundation, then, of all true religion is a rational faith, and of a rational faith these seem to be the chief articles: to believe that an infinite, all-perfect Mind exists, who has no opposite nor any separate interest from that of his creatures; that he superintends and governs all creatures and things; that his goodness extends to all his creatures, in different degrees, indeed, according to their respective natures, but without any partiality or envy; that he does every thing for the best, or in a subserviency to the perfection and happiness of the whole, particularly that he directs and governs the affairs of men, inspects their actions, distinguishes the good from the bad, loves and befriends the former, is displeased with and pities the latter in this world, and will, according to their respective deserts, reward one and punish the other in the next; that, in fine, he is always carrying on a scheme of virtue and happiness through an unlimited duration, and is ever guiding the universe, through its successive stages and periods, to higher degrees of perfection and felicity. This is true *Theism*, the glorious scheme of divine faith; a scheme exhibited in all the works of God, and executed throughout his whole administration.

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Morality of theism, and immorality of atheism.

This faith, well founded and deeply felt, is nearly connected with a true moral taste, and has a powerful efficacy on the temper and manners of the theist. He who admires goodness in others, and delights in the practice of it, must be conscious of a reigning order within, a rectitude and candour of heart, which disposes him to entertain favourable apprehensions of men, and, from an impartial survey of things, to presume that good order and good meaning prevail in the universe; and if good meaning and good order, then an ordering, an intending mind, who is no enemy, no tyrant to his creatures, but a friend, a benefactor, an indulgent sovereign. On the other hand, a bad man, having nothing goodly or generous to contemplate within, no right intentions nor honesty of heart, suspects every person and every thing; and, beholding nature through the gloom of a selfish and guilty mind, is either averse to the belief of a reigning order, or, if he cannot suppress the unconquerable anticipations of a governing mind, he is prone to tarnish the beauty of nature, and to impute malevolence, or blindness and impotence at least, to the Sovereign Ruler. He turns the universe into a forlorn and horrid waste, and transfers his own character to the Deity, by ascribing to him that uncommunicative grandeur, that arbitrary or revengeful spirit, which he affects or admires in himself. As such a temper of mind naturally leads to atheism, or to a superstition fully as bad, therefore, as far as that temper depends on the unhappy creature on whom it prevails, the propensity to atheism, or superstition consequent thereto, must be immoral. Further, if it be true that the belief or sense of a Deity is natural to the mind, and the evidence of his existence reflected from his works so full as to strike even the most superficial observer with conviction, then the supplanting or corrupting that sense, or the want of due attention to that evidence, and, in consequence of both, a supine ignorance or affected unbelief of a Deity, must argue a bad temper or an immoral turn of mind. In the case of invincible ignorance, or a very bad education, although nothing can be concluded directly against the character, yet whenever ill passions and habits pervert the judgment, and by perverting the judgment terminate in atheism, then the case becomes plainly criminal.

The connection of theism and virtue.

But let casuists determine this as they will, a true faith in the divine character and administration is generally the consequence of a virtuous state of mind. The man who is truly and habitually good, feels the love of order, of beauty, and goodness, in the strongest degree; and therefore cannot be insensible to those emanations of them which appear in all the works of God, nor help loving their supreme source and model. He cannot but think,

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that he who has poured such beauty and goodness over all his works, must himself delight in beauty and goodness, and what he delights in must be both amiable and happy. Some indeed there are, and it is pity there should be any such, who, through the unhappy influence of a wrong education, have entertained dark and unfriendly thoughts of the Deity and his administration, though otherwise of a virtuous temper themselves. However, it must be acknowledged that such sentiments have, for the most part, a bad effect on the temper; and when they have not, it is because the undepraved affections of an honest heart are more powerful in their operation than the speculative opinions of an ill-informed head.

Duties of gratitude, love, &c.

But wherever right conceptions of the Deity and his providence prevail, when he is considered as the inexhaustible source of light, and love, and joy, as acting in the joint character of a Father and Governor, imparting an endless variety of capacities to his creatures, and supplying them with every thing necessary to their full completion and happiness, what veneration and gratitude must such conceptions, thoroughly believed, excite in the mind. How natural and delightful must it be to one whose heart is open to the perception of truth, and of every thing fair, great, and wonderful in nature, to contemplate and to adore him who is the first fair, the first great, and first wonderful; in whom wisdom, power, and goodness dwell vitally, essentially, originally, and act in perfect concert. What grandeur is here to fill the most enlarged capacity, what beauty to engage the most ardent love, what a mass of wonders in such exuberance of perfection to astonish and delight the human mind through an unfailing duration.

Other affections.

If the Deity be considered as our Supreme Guardian and Benefactor, as the Father of Mercies, who loves his creatures with infinite tenderness, and in a particular manner all good men, nay all who delight in goodness, even in its most imperfect degrees; what resignation, what dependence, what generous confidence, what hope in God and his all-wise providence, must arise in the soul that is possessed of such amiable views of Him. All those exercises of piety, and, above all, a superlative esteem and love, are directed to God as to their natural, their ultimate, and indeed their only adequate object; and though the immense obligations we have received from him may excite in us more lively feelings of divine goodness than a general and abstracted contemplation of it, yet the affections of gratitude and love are of themselves of the generous, disinterested kind, not the result of self-interest, or views of reward. A perfect character, in which we always suppose infinite goodness, guided by unerring wisdom, and supported by almighty power, is the proper object of perfect love; which, as such, we are forcibly drawn to pursue and to aspire after. In the contemplation of the divine nature and attributes, we find at last what the ancient philosophers sought in vain, the supreme and sovereign good, from which all other goods arise, and in which they are all contained. The Deity, therefore, challenges our supreme and sovereign love, a sentiment which, whosoever indulges, must be confirmed in the love of virtue, in a desire to imitate its all-perfect pattern, and in a cheerful security that all his great concerns, those of his friends and of the universe, shall be absolutely safe under the conduct of unerring wisdom and unbounded goodness. It is in his care and providence alone that the good man, who is anxious for the happiness of all, finds perfect serenity; a serenity neither ruffled by partial ill, nor soured by private disappointment.

When we consider the unstained purity and the absolute perfection of the divine nature, and reflect withal on the imperfection and various blemishes of our own, we must sink, or be convinced we ought to sink, into the deepest humility and prostration of soul before him who is so wonderfully great and holy. When, further, we call to mind what low and languid feelings we have of the divine presence and majesty, what insensibility of his fatherly and universal goodness, nay, what ungrateful returns we have made to it, how far we come short of the perfection of his law, and the dignity of our own nature, how much we have indulged in selfish passions, and how little we have cherished the benevolent ones, we must be conscious that it is our duty to repent of a temper and conduct so unworthy our nature, and unbecoming our obligations to its Author, and to resolve and endeavour to act a wiser and better part for the future.

Duty to God. Repentance, &c.

Nevertheless, from the character which his works exhibit of him, from those delays or alleviations of punishment which offenders often experience, and from the merciful tenor of his administration in many other instances, the sincere penitent may entertain good hopes that his Parent and Judge will not be strict to mark iniquity, but will be propitious and favourable to him, if he honestly endeavour to avoid his former practices, and subdue his former habits, and to live in a greater conformity to the divine will for the future. If any doubts or fears should still remain, how far it may be consistent with the rectitude and equity of the divine government to let his iniquities pass unpunished, yet he cannot think it unsuitable to his paternal clemency and wisdom to contrive a method of retrieving the penitent offender, which shall unite and reconcile the majesty and mercy of his government. If reason cannot of itself suggest such a scheme, it gives at least some ground to expect it. But although natural religion cannot let in moral light and assurance on so interesting a subject, yet it will teach the humble theist to wait with great submission for any further intimations it may please the Supreme Governor to give of his will; to examine with candour and impartiality whatever evidence shall be proposed to him of a divine revelation, whether that evidence is natural or supernatural; to embrace it with veneration and cheerfulness, if the evidence be clear and convincing; and, finally, if it bring to light any new relations or connections, natural religion will persuade its sincere votary faithfully to comply with the obligations and perform the duties which result from those relations and connections. This is theism, piety, the completion of morality.

Hopes of pardon.

Worship, praise, thanksgiving.

We must further observe, that all those affections which we supposed to regard the Deity as their immediate and primary object, are vital energies of the soul, and consequently exert themselves in action, and, like all other energies, gain strength or greater activity by that exertion. It is therefore our duty, as well as highest interest, often, at stated times, and by decent and solemn acts, to contemplate and adore the great Original of our existence, the Parent of all beauty and of all good; to express our veneration and love by an awful and devout recognition of his perfections; and to evidence our gratitude by celebrating his goodness, and thankfully acknowledging all his benefits. It is likewise our duty, by proper exercises of sorrow and humiliation, to confess our ingratitude and folly; to signify our dependence on God, and our confidence in his goodness, by imploring his blessing and gracious concurrence in assisting the weakness and curing the corruptions of our nature; and, finally, to testify our sense of his authority, and our faith in his government, by devoting ourselves to do his will, and resigning ourselves to his disposal. These duties are not therefore obligatory because the Deity needs or can be profited by them; but as they are apparently decent and moral, suitable to the relations he sustains of our Creator, Benefactor, Lawgiver, and Judge; expressive of our state and obligations; and improving to our tempers, by making us more rational, social, god-like, and consequently more happy.

We have now considered *internal* piety, or the worship

Culture of the Mind. External worship.

of the mind, that which is in spirit and in truth; we shall conclude the section with a short account of that which is *external.* External worship is founded on the same principles as internal, and is of as strict moral obligation. It is either private or public. Devotion that is inward, or purely intellectual, is too spiritual and abstracted an operation for the bulk of mankind. The operations of their minds, such especially as are employed on the most sublime, immaterial objects, must be assisted by their outward organs, or by some help from the imagination; otherwise they will soon be dissipated by sensible impressions, or grow tiresome if too long continued. Ideas are such fleeting things, that they must be fixed; and so subtile, that they must be expressed and delineated, as it were, by sensible marks and images; otherwise we cannot attend to them, nor be much affected by them. Therefore, verbal adoration, prayer, praise, thanksgiving, and confession, are admirable aids to inward devotion; they fix our attention, compose and enliven our thoughts, impress us more deeply with a sense of the awful presence in which we are, and, by a natural and mechanical sort of influence, tend to heighten those devout feelings and affections which we ought to entertain, and after this manner reduce into formal and explicit acts. Culture of the Mind.

Public worship.

This holds true in a higher degree in the case of public worship, where the presence of our fellow-creatures, and the powerful contagion of the social affections, conspire to kindle and spread the devout flame with greater warmth and energy. In fine, as God is the parent and head of the social system, as he has formed us for a social state, as by the one we find the best security against the ills of life, and in the other enjoy its greatest comforts, and as, by means of both, our nature attains its highest improvement and perfection; and, moreover, as there are public blessings and crimes in which we all in some degree share, and public wants and dangers to which all are exposed; it is therefore evident, that the various and solemn offices of public religion are duties of indispensable moral obligation, amongst the best cements of society, the firmest prop of government, and the fairest ornament of both.

PART III.

CHAP. I.—OF PRACTICAL ETHICS, OR THE CULTURE OF THE MIND.

Dignity and importance of the subject.

We have now gone through a particular detail of the several duties which we owe to *ourselves*, to *society*, and to *God*. In considering the first order of duties, we just touched on the methods of acquiring the different kinds of goods which we are led by nature to pursue; only we left the consideration of the methods of acquiring the moral goods of the mind to a chapter by itself, because of its singular importance. This chapter, then, will contain a brief enumeration of the arts of acquiring virtuous habits, and of eradicating vicious ones, as far as is consistent with the brevity of such a work; a subject of the utmost difficulty as well as importance in morals, to which, nevertheless, the least attention has been generally given by moral writers. This will properly follow a detail of duty, as it will direct us to such means or helps as are most necessary and conducive to the practice of it.

Sensible ideas and sensible taste.

In the first part of this inquiry we traced the order in which the passions shoot up in the different periods of human life. That order is not accidental or dependent upon the caprice of men, or the influence of custom and education, but arises from the original constitution and laws of our nature; of which this is one, viz. that sensible objects make the first and strongest impressions on the mind. These, by means of our outward organs, being conveyed to the mind, become objects of its attention, on which it reflects when the outward objects are no longer present, or, in other words, when the impressions upon the outward organs cease. These objects of the mind's reflection are called ideas or notions. Towards these, by another law of our nature, we are not altogether indifferent; but correspondent movements of desire or aversion, love or hatred, arise, according as the objects which they denote made an agreeable or disagreeable impression on our organs. Those ideas and affections which we experience in the first period of life, we refer to the body, or to sense; the taste which is formed towards them, we call a sensible, or a merely natural taste, and the objects corresponding to them we in general call good or pleasant.

Ideas of beauty and a fine taste.

But as the mind moves forward in its course, it extends its views, and receives a new and more complex set of ideas, in which it observes uniformity, variety, similitude, symmetry of parts, reference to an end, novelty, grandeur. These compose a vast train and diversity of imagery, which the mind compounds, divides, and moulds into a thousand forms, in the absence of those objects which first introduced it. And this more complicated imagery suggests a new train of desires and affections, fully as sprightly and engaging as any which have yet appeared. This whole class of perceptions or impressions is referred to the imagination, and forms a higher taste than the sensible, and which has an immediate and mighty influence on the finer passions of our nature, and is commonly termed a *fine taste.* The objects which correspond to this taste we usually call beautiful, great, harmonious, or wonderful, or in general by the name of beauty.

Moral ideas and a moral taste.

The mind, still pushing onwards and increasing its stock of ideas, ascends from these to a higher species of objects, viz. the order and mutual relations of minds to each other, their reciprocal affections, characters, actions, and various aspects. In these it discovers a beauty, a grandeur, a decorum, more interesting and alluring than in any of the former kinds. These objects, or the notions of them, passing in review before the mind, do, by a necessary law of our nature, call forth another and nobler set of affections, as admiration, esteem, love, honour, gratitude, benevolence, and others of the like tribe. This class of perfections, and their correspondent affections, we refer, because of their objects (manners), to a moral sense, and call the taste or temper they excite *moral;* and the objects which are agreeable to this taste or temper we denominate by the general name of moral beauty, in order to distinguish it from the other, which is termed natural.

Sources of association.

These different sets of ideas or notions are the materials about which the mind employs itself, which it blends, ranges, and diversifies in ten thousand different ways. It feels a strong propension to connect and associate those ideas amongst which it observes any similitude or any aptitude, whether original and natural, or customary and artificial, to suggest each other. (See METAPHYSICS.)

Laws of association.

But whatever the reasons are, whether similitude, coexistence, causality, or any other aptitude or relation, why any two or more ideas are connected by the mind at first, it is an established law of our nature, that when two or more ideas have often started in company, they form so strong an union, that it is very difficult ever after to separate them. Thus the lover cannot separate the idea of merit from his mistress; the courtier that of dignity from his title or ribbon; the miser that of happiness from his bags. It is these associations of worth or happiness with any of the different sets of objects or images before specified that form our taste or complex idea of good. By an-

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other law of our nature, our affections follow and are governed by this taste. And to these affections our character and conduct are similar and proportioned, on the general tenor of which our happiness principally depends.

Leading passions follow taste.

As all our leading passions, then, depend on the direction which our taste takes, and as it is always of the same strain with our leading associations, it is worth while to inquire a little more particularly how these are formed, in order to detect the secret sources whence our passions derive their principal strength, their various rises and falls. For this will give us the true key to their management, and let us into the right method of correcting the bad and improving the good.

Importance of the imagination.

No kind of objects make so powerful an impression upon us as those which are immediately impressed upon our senses, or strongly painted upon our imaginations. Whatever is purely intellectual, as abstracted or scientific truths, the subtile relations and differences of things, has a fainter sort of existence in the mind, and, though it may exercise and whet the memory, the judgment, or the reasoning power, gives hardly any impulse at all to the active powers, the passions, which are the mainsprings of motion. On the other hand, were the mind entirely under the direction of sense, and impressible only by such objects as are present, and strike some of the outward organs, we should then be precisely in the state of the brute creation, and be governed solely by instinct or appetite, and have no power to control whatever impressions are made upon us. Nature has therefore endowed us with a middle faculty, wonderfully adapted to our mixed state, which holds partly of sense and partly of reason; being strongly allied to the former, and the common receptacle in which all the notices that come from that quarter are treasured up, and yet greatly subservient and ministerial to the latter, by giving a body, a coherence, and a beauty to its conceptions. This middle faculty is called the *imagination*, one of the most busy and fruitful powers of the mind. Into this common storehouse are likewise carried all those moral forms which are derived from our moral faculties of perception; and there they often undergo new changes and appearances, by being mixed and wrought up with the ideas and forms of sensible or natural things. By this coalition of imagery, natural beauty is dignified and heightened by moral qualities and perfections, and moral qualities are at once exhibited and set off by natural beauty. The sensible beauty, or good, is refined from its dross by partaking of the moral; and the moral receives a stamp, a visible character and currency, from the sensible.

As we are first of all accustomed to sensible impressions and sensible enjoyments, we contract early a sensual relish or love of pleasure in the lower sense of the word. In order, however, to justify this relish, the mind, as it becomes open to higher perceptions of beauty and good, borrows from thence a noble set of images, as fine taste, generosity, social affections, friendship, good fellowship, and the like; and, by dressing out the old pursuits with these new ornaments, gives them an additional dignity and lustre. By these ways the desire of a table, love of finery, intrigue, and pleasure, are vastly increased beyond their natural pitch, having an impulse combined of the force of the natural appetites, and of the superadded strength of those passions which tend to the moral species. When the mind becomes more sensible to those objects or appearances in which it perceives beauty, uniformity, grandeur, and harmony, as fine clothes, elegant furniture, plate, pictures, gardens, houses, equipage, the beauty of animals, and particularly the attractions of the sex; to these objects the mind is led by nature or taught by custom, the opinion and example of others, to annex certain ideas of moral character, dignity, decorum, honour, liberality, tenderness, and active or social enjoyment. The consequence of this association is, that the objects to which these are annexed must rise in their value, and be pursued with proportionable ardour; the enjoyment of them is often attended with pleasure; and the mere possession of them, where that is wanting, frequently draws respect from one's fellow-creatures. This respect is, by many, thought equivalent to the pleasure of enjoyment. Hence it happens that the idea of happiness is connected with the mere possession, which is therefore eagerly sought after, without any regard to the generous use or honourable enjoyment. Thus the passion, resting on the means, not the end, that is, losing sight of its natural object, becomes wild and extravagant.

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In fine, any object, or external denomination, a staff, a garter, a cup, a crown, a title, may become a moral badge or emblem of merit, magnificence, or honour, according as these distinctions have been found or thought, by the possessors or admirers of them, to accompany them; yet, by the deception formerly mentioned, the merit or the conduct which entitled, or should entitle, to those marks of distinction, shall be forgot or neglected, and the badges themselves be passionately affected or pursued, as including every excellence. If these are attained by any means, all the concomitants which nature, custom, or accidents have joined to them, will be supposed to follow of course. Thus, moral ends, with which the unhappy admirer is apt to colour over his passion and views, will, in his opinion, justify the most immoral means; as prostitution, adulation, fraud, treachery, and every species of knavery, whether more open or more disguised.

When men are once engaged in active life, and find that wealth and power, generally called *interest*, are the great avenues to every kind of enjoyment, they are apt to throw in many engaging moral forms to the object of their pursuit, in order to justify their passion, and varnish over the measures they take to gratify it, as independence on the vices or passions of others, provision and security to themselves and friends, prudent economy or well-placed charity, social communication, superiority to their enemies, who are all villains, honourable service, and many other ingredients of merit. To attain such capacities of usefulness or enjoyment, what arts, nay what meannesses, can be thought blameable by those cool pursuers of their own interest. Nor have they whom the gay world are pleased to indulge with the title of men of pleasure, their imaginations less pregnant with moral images, with which they never fail to ennoble, or, if they cannot do that, to palliate their gross pursuits. Thus admiration of wit, of sentiments and merit, friendship, love, generous sympathy, mutual confidence, giving and receiving pleasure, are the ordinary ingredients with which they season their gallantry and pleasurable entertainments, and by which they impose on themselves, and endeavour to impose on others, that their amours are the joint issue of good sense and virtue.

These associations, variously combined and proportioned by the imagination, form the leading private passions which govern the lives of the generality, as the love of action, of pleasure, power, wealth, and fame; they influence the defensive, and affect the public passions, and raise joy or sorrow as they are gratified or disappointed; so that in effect these associations of good and evil, beauty and deformity, and the passions they raise, are the main hinges of life and manners, and the great sources of our happiness or misery. It is very evident, therefore, that the whole of moral culture must depend on giving a right direction to the leading passions, and duly proportioning them to the value of the objects or goods pursued, under what name soever they may appear.

Moral culture.

Now, in order to give them this right direction and due proportion, it appears, from the foregoing detail, that those associations of ideas, upon which the passions depend,

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must be duly regulated: that is to say, as an exorbitant passion for wealth, pleasure, or power, flows from an association or opinion, that more beauty and good, whether natural or moral, enters into the enjoyment or possession of them, than really belongs to either, therefore, in restoring those passions to their just proportion, we must begin with correcting the opinion, or breaking the false association; or, in other words, we must decompound the complex phantom of happiness or good, which we fondly admire; disunite those ideas which have no natural alliance; and separate the original idea of wealth, power, or pleasure, from the foreign mixtures incorporated with it, which enhance its value, or give it its chief power to enchant and seduce the mind. For instance, let it be considered how poor and inconsiderable a thing wealth is, if it be disjoined from real use, or from ideas of capacity in the possessor to do good, from independence, generosity, provision for a family or friends, and social communication with others. By this standard let its true value be fixed, let its misapplication or unbenevolent enjoyment be accounted sordid and infamous, and nothing worthy or estimable be ascribed to the mere possession of it which is not borrowed from its generous use.

If that complex form of good which is called *pleasure* engage us, let it be analysed into its constituent principles, or those allurements it draws from the heart and imagination, in order to heighten the low part of the indulgence; let the separate and comparative import of each be distinctly ascertained and deduced from that gross part, and this remainder of the accumulated enjoyment will dwindle down into a poor, insipid, transitory thing. In proportion as the opinion of the good pursued abates, the admiration must decay, and the passions lose strength of course. One effectual way to lower the opinion, and consequently to weaken the habit founded upon it, is to practise lesser pieces of self-denial, or to abstain, to a certain pitch, from the pursuit or enjoyment of the favourite object; and, that this may be the more easily accomplished, one must avoid those occasions, that company, those places, and the other circumstances, that inflamed the one and endeared the other. And, as a counter-process, let higher or even different enjoyments be brought in view, other passions played upon the former, different places frequented, other exercises tried, company kept with persons of a different or more correct way of thinking both in natural and moral subjects.

As much depends on our setting out well in life, let the youthful fancy, which is apt to be very florid and luxuriant, be early accustomed, by instruction, example, and significant moral exercises, nay, by looks, gestures, and every other testimony of just approbation or blame, to annex ideas of merit, honour, and happiness, not to birth, dress, rank, beauty, fortune, power, popularity, and the like outward things, but to moral and truly virtuous qualities, and to those enjoyments which spring from a well-informed judgment and a regular conduct of the affections, especially those of the social and disinterested kind. Such dignified forms of beauty and good, often suggested, and by moving pictures and examples warmly recommended to the imagination, enforced by the authority of conscience, and demonstrated by reason to be the surest means of enjoyment, and the only independent, undeprivable, and durable goods, will be the best counterbalance to meaner passions, and the firmest foundation and security of virtue.

It is of great importance to the forming a just taste, or pure and large conceptions of happiness, to study and understand human nature well, to remember what a complicated system it is, particularly to have deeply imprinted on our mind that *gradation* of senses, faculties, and powers of enjoyment formerly mentioned, and the subordination of goods resulting from thence, which nature points out, and the experience of mankind confirms. Who, when they think seriously, and are not under the immediate influence of some violent prejudice or passion, prefer not the pleasures of action, contemplation, society, and most exercises and joys of the moral kind, as friendship, natural affection, and the like, to all sensual gratifications whatsoever? Where the different species of pleasure are blended into one complex form, let them be accurately distinguished, and be referred each to its proper faculty and sense, and examined apart what they have peculiar, what common with others, and what foreign and adventitious. Let wealth, grandeur, luxury, love, fame, and the like, be tried by this test, and their true alloy will be found out. Let it be further considered, whether the mind may not be easy and enjoy itself greatly, though it want many of those elegancies and superfluities of life which some possess, or that load of wealth and power which others eagerly pursue, and under which they groan. Let the difficulty of attaining, the precariousness of possessing, and the many abatements in enjoying, overgrown wealth and envied greatness, of which the weary possessors so frequently complain, as the hurry of business, the burden of company, of paying attendance to the few, and giving it to many, the cares of keeping, the fears of losing, and the desires of increasing what they have, and the other troubles which accompany this pitiful drudgery and pompous servitude; let these and the like circumstances be often considered, that are conducive to the removing or lessening the opinion of such goods, and the attendant passion or set of passions will decay of course.

Let the peculiar bent of our nature and character be observed, whether we are most inclined to form associations and relish objects of the sensible, intellectual, or moral kind. Let that which has the ascendant be particularly watched; let it be directed to right objects, be improved by proportioned exercises, and guarded by proper checks from an opposite quarter. Thus the sensible turn may be exalted by the intellectual, and a taste for the beauty of the fine arts, and both may be made subservient to convey and rivet sentiments highly moral and public-spirited. This inward survey must extend to the strength and weaknesses of one's nature, conditions, connections, habitudes, fortunes, studies, acquaintance, and the other circumstances of life, from which every man will form the justest estimate of his own dispositions and character, and the best rules for correcting and improving them. And in order to do this with more advantage, let those times or critical seasons be watched when the mind is best disposed towards a change; and let them be improved by rigorous resolutions, promises, or whatever else will engage the mind to persevere in virtue. Let the conduct, in fine, be often reviewed, and the causes of its corruption or improvement be carefully observed.

It will greatly conduce to refine the moral taste and strengthen the virtuous temper, to accustom the mind to the frequent exercise of moral sentiments and determinations, by reading history, poetry, particularly of the picturesque and dramatic kind, the study of the fine arts; by conversing with the most eminent for good sense and virtue; and, above all, by frequent and repeated acts of humanity, compassion, friendship, politeness, and hospitality. It is exercise that gives health and strength. He who reasons most frequently becomes the wisest, and most enjoys the pleasures of wisdom. He who is most often affected by objects of compassion in poetry, history, or real life, will have his soul most open to pity, and its delightful pains and duties. So he also who practises most diligently the offices of kindness and charity, will by it cultivate that disposition whence must arise all his pretensions to personal merit, his present and his future happiness.

An useful and honourable employment in life will administer a thousand opportunities of this kind, and greatly

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strengthen a sense of virtue and good affections, which, as well as our understandings, must be nourished by light training. For such an employment, by enlarging one's experience, giving a habit of attention and caution, or obliging one, from necessity or interest, to keep a guard over the passions, and to study the outward decencies and appearances of virtue, will by degrees produce a good habit, and at length insinuate the love of virtue and honesty for its own sake.

It is a great inducement to the exercise of benevolence to view human nature in a favourable light, to observe the characters and circumstances of mankind on the fairest sides, to put the best constructions they will bear on their actions, and to consider them as the result of partial and mistaken rather than ill affections, or, at worst, as the excesses of a pardonable self-love, seldom or never the effect of pure malice.

Above all, the nature and consequences of virtue and vice, such consequences being the law of our nature and will of Heaven, the light in which they appear to our Supreme Parent and Lawgiver, and the reception they will meet with from him, must be often attended to. The exercises of piety, as adoration and praise of the divine excellence, invocation of and dependence on his aid, confession, thanksgiving, and resignation, are habitually to be indulged, and frequently performed, not only as medicinal, but highly improving to the temper.

In fine, it will be of admirable efficacy towards eradicating bad habits, and implanting good ones, frequently to contemplate human life as the great nursery of our future and immortal existence, as that state of probation in which we are to be educated for a divine life; to remember that our virtues or vices will be as immortal as ourselves, and influence our future as well as our present happiness, and therefore, that every disposition and action is to be regarded as pointing beyond the present to an immortal duration. An habitual attention to this wide and important connection will give a vast compass and dignity to our sentiments and actions, a noble superiority to the pleasures and pains of life, and a generous ambition to render our virtue as immortal as our being.

CHAP. II.—MOTIVES TO VIRTUE FROM PERSONAL HAPPINESS.

Motives from personal happiness.

We have already considered our obligations to the practice of virtue, arising from the constitution of our nature, by which we are led to approve a certain order and economy of affections, and a certain course of action correspondent to it. But, besides this, there are several motives which strengthen and secure virtue, though not themselves of a moral kind. These are, its tendency to personal happiness, and the contrary tendency of vice. Personal happiness arises either from the state of a man's own mind, or from the state and disposition of external causes towards him.

Happiness of virtue from within.

We shall first examine the tendency of virtue to happiness with respect to the state of a man's own mind. This is a point of the utmost consequence in morals, because, unless we can convince ourselves, or show to others, that, by doing our duty, or fulfilling our moral obligations, we consult the greatest satisfaction of our own mind, or our highest interest on the whole, it will raise strong and often unsurmountable prejudices against the practice of virtue, especially whenever there arise any appearances of opposition between our duty and our satisfaction or interest. To creatures so desirous of happiness, and so averse to misery, as we are, and often so oddly situated amidst contending passions and interests, it is necessary that virtue should appear not only in an honourable, but a pleasing and beneficent form; and in order to justify our choice to ourselves as well as to others, we must ourselves feel and be able to avow in the face of the whole world, that her ways are ways of pleasantness, and her paths the paths of peace. This will show, beyond all contradiction, that we not only approve what is good, but can give a sufficient reason for our own conduct.

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Let any man in a cool hour, when he is disengaged from business, and undisturbed by passion (such cool hours will sometimes occur), sit down, and seriously reflect with himself what state or temper of mind he would choose to feel and indulge, in order to be easy and to enjoy himself. Would he choose, for that purpose, to be in a constant dissipation and hurry of thought; to be disturbed in the exercise of his reason; to have various and often interfering phantoms of good playing before his imagination, soliciting and distracting him by turns, now soothing him with amusing hopes, then torturing him with anxious fears, and to approve this minute what he shall condemn the next? Would he choose to have a strong and painful sense of every petty injury; quick apprehensions of every impending evil; incessant and insatiable desires of power, wealth, honour, pleasure; an irreconcilable antipathy against all competitors and rivals; insolent and tyrannical dispositions to all below him; fawning, and at the same time envious, dispositions to all above him, with dark suspicions and jealousies of every mortal? Would he choose neither to love nor be beloved of any; to have no friend in whom to confide, or with whom to interchange his sentiments or designs; no favourite, on whom to bestow his kindness, or vent his passions; and to be conscious of no merit with mankind, no esteem from any creature, no good affection to his Maker, no concern for, nor hopes of, his approbation; but instead of all these, to hate, and know that he is hated, to condemn, and know that he is condemned, by all, by the good because he is so unlike, and by the bad because he is so like, themselves; to hate or to dread the very Being that made him; and, in short, to make his breast the seat of pride and passion, petulance and revenge, deep melancholy, cool malignity, and all the other furies that ever possessed and tortured mankind? Would our calm inquirer after happiness pitch on such a state, and such a temper of mind, as the most likely means to put him in possession of his desired ease and self-enjoyment?

Influence of vice on the temper of the mind.

Influence of virtue on the temper.

Or would he rather choose a serene and easy flow of thought; a reason clear and composed; a judgment unbiassed by prejudice, and undistracted by passion; a sober and well-governed fancy, which presents the images of things true and unmixed with delusive and unnatural charms, and therefore administers no improper or dangerous fuel to the passions, but leaves the mind free to choose or reject, as becomes a reasonable creature; a sweet and sedate temper, not easily ruffled by hopes or fears, prone neither to suspicion nor revenge, apt to view men and things in the fairest lights, and to bend gently to the humours of others rather than obstinately to contend with them? Would he choose such moderation and continence of mind, as neither to be ambitious of power, fond of honours, covetous of wealth, nor a slave to pleasure; a mind of course neither elated with success, nor dejected with disappointment; such a modest and noble spirit as supports power without insolence, wears honour without pride, uses wealth without profusion or parsimony, and rejoices more in giving than in receiving pleasure; such fortitude and equanimity as rises above misfortunes, or turns them into blessings; such integrity and greatness of mind as neither flatters the vices nor triumphs over the follies of men, as equally spurns servitude and tyranny, and will neither engage in low designs, nor abet them in others? Would he choose, in fine, such mildness and benignity of heart as

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takes part in all the joys, and refuses none of the sorrows, of others; stands well affected to all mankind; is conscious of meriting the esteem of all, and of being beloved by the best; a mind which delights in doing good without any show, and yet arrogates nothing on that account; rejoices in loving and being beloved by its Maker, acts ever under his eye, resigns itself to his providence, and triumphs in his approbation? Which of these dispositions would be his choice in order to become contented, serene, and happy? The former temper is *vice*, the latter *virtue*. Where one prevails, there *misery* prevails, and by the generality is acknowledged to prevail. Where the other reigns, there *happiness* reigns, and by the confession of mankind is acknowledged to reign. The perfection of either temper is misery or happiness in perfection. Therefore, every approach to either extreme is an approach to misery or to happiness, that is, every degree of vice or virtue is accompanied with a proportional degree of misery or happiness.

The alleviations of a virtuous man's ills.

The principal alleviations of a virtuous man's calamities are these: That though some of them may have been the effect of his imprudence or weakness, yet few of them are sharpened by a sense of guilt, and none of them by a consciousness of wickedness, which surely is their keenest sting; that they are common to him with the best of men; that they seldom or never attack him quite unprepared, but rather guarded with a consciousness of his own sincerity and virtue, with a faith and trust in Providence, and a firm resignation to its perfect orders; that they may be improved as means of correction, or materials to give scope and stability to his virtues; and, to say no more, that they are considerably lessened, and often sweetened to him, by the general sympathy of the wise and good.

His enjoyments are more numerous, or, if less numerous, yet more intense, than those of the bad man; for he shares in the joys of others by rebound, and every increase of general or particular happiness is a real addition to his own. It is true, his friendly sympathy with others subjects him to some pains which the hard-hearted wretch does not feel; yet to give a loose rein to it, is a kind of agreeable discharge. It is such a sorrow as he loves to indulge; a sort of pleasing anguish, which sweetly melts the mind, and terminates in a self-approving joy. Though the good man may want means to execute, or be disappointed in the success of his benevolent purposes, yet, as was formerly observed, he is still conscious of good affection, and that consciousness is an enjoyment of a more delightful savour than the greatest triumphs of successful vice. If the ambitious, covetous, or voluptuous, are disappointed, their passions recoil upon them with a fury proportioned to their opinion of the value of what they pursue, and their hope of success; whilst they have nothing within to balance the disappointment, unless it be an useless fund of pride, which, however, frequently turns mere accidents into mortifying affronts, and exalts grief into rage and frenzy. But the meek, humble, and benevolent temper is its own reward, and is satisfied from within; as it magnifies greatly the pleasure of success, so it wonderfully alleviates, and in a manner annihilates, all pain for the want of it.

As the good man is conscious of loving and wishing well to all mankind, he must be sensible of his deserving the esteem and good will of all; and this supposed reciprocation of social feelings is, by the very frame of our nature, made a source of very intense and enlivening joys. By this sympathy of affections and interests, he feels himself intimately united with the human race; and, being sensibly alive over the whole system, his heart receives and becomes responsive to every touch given to any part. Thus, as an eminent philosopher[1] finely expresses it, he gathers contentment and delight from the pleased and happy states of those around him; from accounts and relations of such happiness; from the very countenances, gestures, voices, and sounds, even of creatures foreign to our kind, whose signs of joy and contentment he can any way discern. Nor do those generous affections stop any other natural source of joy whatever, or deaden his sense of any innocent gratification. They rather keep the several senses and powers of enjoyment open and disengaged, intense and uncorrupted by riot or abuse; as is evident to any one who considers the dissipated, unfeeling state of men of pleasure, ambition, or interest, and compares it with the serene and gentle state of a mind at peace with itself, and friendly to all mankind, unruffled by any violent emotion, and sensible to every good-natured and alluring joy.

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Misery of excess in the private passions.

It were easy, by going through the different sets of affections formerly mentioned, to show, that it is only by maintaining the proportion settled there, that the mind arrives at true repose and satisfaction. If fear exceeds that proportion, it sinks into melancholy and dejection. If anger passes just bounds, it ferments into rage and revenge, or subsides into a sullen corroding gloom, which embitters every good, and renders one exquisitely sensible to every ill. The private passions, the love of honour especially, the impulses of which are more generous, as its effects are more diffusive, are instruments of private pleasure; but if they are disproportioned to our wants, or to the value of their several objects, or to the balance of other passions equally necessary and more amiable, they become instruments of intense pain and misery. For, being now destitute of that counterpoise which held them at a due pitch, they grow turbulent, peevish, and revengeful, the cause of constant restlessness and torment, sometimes flying out into a wild delirious joy, at other times settling in a deep splenetic grief. The concert between reason and passion is then broken; all is dissonance and distraction within. The mind is out of frame, and feels an agony proportioned to the violence of the reigning passion.

The case is much the same, or rather worse, when any of the particular kind affections are out of their natural order and proportion; as happens in the case of effeminate pity, exorbitant love, parental dotage, or any party passion, where the just regards to society are supplanted. The more social and disinterested the passion is, it breaks out into the wilder excesses, and makes the more dreadful havoc both within and abroad; as is but too apparent in those cases where a false species of religion, honour, zeal, or party rage, has seized on the natural enthusiasm of the mind, and worked it up to madness. It breaks through all ties natural and civil, disregards the most sacred and solemn obligations, silences every other affection whether public or private, and transforms the most gentle natures into the most savage and inhuman.

Happiness of well-proportioned passions.

But the man who keeps the balance of affection even, is easy and serene in his motions, mild and yet affectionate, uniform and consistent with himself; he is not liable to disagreeable collisions of interests and passions; gives always place to the most friendly and humane affections, and never to dispositions or acts of resentment, but on high occasions, when the security of the private, or welfare of the public system, or the great interests of mankind, necessarily require a noble indignation, and even then he observes a just measure in wrath; and, last of all, he proportions every passion to the value of the object he affects, or to the importance of the end he pursues.

Sum of the argument.

To sum up this part of the argument, the honest and good man has eminently the advantage of the knavish and selfish wretch in every respect. The pleasures which the last enjoys flow chiefly from external advantages and gratifications; they are superficial and transitory, dashed with

[1] Shaftesbury, Inquiry into Virtue, book ii.

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long intervals of satiety, and frequent returns of remorse and fear, dependent on favourable accidents and conjunctures, and subjected to the humours of men. But the good man is satisfied with himself; his principal possessions lie within, and therefore beyond the reach of the caprice of men or fortune; his enjoyments are exquisite and permanent, accompanied with no inward checks to damp them, and always with ideas of dignity and self-approbation, and they may be tasted at any time, and in any place. The gratifications of vice are turbulent and unnatural, generally arising from the relief of passions in themselves intolerable, and issuing in tormenting reflection; often irritated by disappointment, always inflamed by enjoyment, and yet ever cloyed with repetition. The pleasures of virtue are calm and natural, flowing from the exercise of kind affections, or delightful reflections in consequence of them; not only agreeable in the prospect, but in the present feeling, they never satiate nor lose their relish, nay, rather the admiration of virtue grows stronger every day; not only is the desire, but the enjoyment, heightened by every new gratification, and, unlike to most others, it is increased, not diminished, by sympathy and communication. In fine, the satisfactions of virtue may be purchased without a bribe, and possessed in the humblest as well as in the most triumphant fortune; they can bear the strictest review, and do not change with circumstances, nor grow old with time. Force cannot rob, nor fraud cheat us of them; and, to crown all, instead of abating, they enhance every other pleasure.

External effects of virtue.

But the happy consequences of virtue are seen not only in the internal enjoyments it affords a man, but in the favourable disposition of external causes towards him, to which it contributes. As virtue gives the sober possession of one's self, and the command of one's passions, the consequence must be heart's ease, and a fine natural flow of spirits, which conduce more than any thing else to health and long life. Violent passions, and the excesses they occasion, gradually impair and wear down the machine. But the calm, placid state of a temperate mind, and the healthful exercises in which virtue engages her faithful votaries, preserve the natural functions in full vigour and harmony, and exhilarate the spirits, which are the chief instruments of action.

It may be thought odd by some to assert that virtue is no enemy to a man's fortune in the present state of things. But if by fortune be meant a moderate or competent share of wealth, power, or credit, not overgrown degrees of them, what should hinder the virtuous man from obtaining that? He cannot cringe nor fawn, it is true, but he can be civil and obliging as well as the knave; and surely his civility is more alluring, because it has more manliness and grace in it than the mean adulation of the other. He cannot cheat nor undermine, but he may be cautious, provident, watchful of occasions, and equally prompt with the rogue in improving them. He scorns to prostitute himself as a pander to the passions or as a tool to the vices of mankind, but he may have as sound an understanding and as good capacities for promoting their real interests as the veriest court slave; and then he is more faithful and true to those who employ him. In the common course of business, he has the same chances with the knave of acquiring a fortune, and rising in the world. He may have equal abilities, equal industry, equal attention to business, and in other respects he has greatly the advantage of him. People love better to deal with him; they can trust him more; they know he will not impose upon them, nor take advantage of them, and they can depend more on his word than on the oath or strongest securities of others. But what is commonly called *cunning*, which is the offspring of ignorance, and the constant companion of knavery, is not only a mean-spirited, but a very short-sighted talent, and a fundamental obstacle in the road of business. It may, indeed, procure immediate and petty gains; but it is attended with dreadful abatements, which do more than overbalance them, both as it sinks a man's credit when discovered, and cramps that largeness of mind which extends to the remotest as well as the nearest interest, and takes in the most durable equally with the most transient gains. It is therefore easy to see how much a man's credit and reputation, and consequently his success, depend upon his honesty and virtue.

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With regard to security and peace with his neighbours, it may be thought perhaps that the man of a quiet forgiving temper, and an overflowing benevolence and courtesy, is much exposed to injury and affronts from every proud or peevish mortal who has the power or will to do mischief. If we suppose, indeed, this quietness and gentleness of nature accompanied with cowardice and pusillanimity, this may often be the case; but in reality the good man is as bold as a lion, and so much the bolder for being the calmer. Such a person will hardly become a butt to mankind. The ill natured will be afraid to provoke him, and the good natured will not incline to do it. Besides, true virtue, which is conducted by reason, and exerted gracefully and without parade, is a most insinuating and commanding thing; if it cannot disarm malice and resentment at once, it will wear them out by degrees, and subdue them at length. How many have, by favours and by prudently yielding, triumphed over an enemy, who would have been inflamed into tenfold rage by the fiercest opposition. In fine, goodness is the most universally popular thing that can be imagined.

In a word, the good man may have some enemies, but he will have more friends; and, having given so many marks of private friendship and public virtue, he can hardly be destitute of a patron to protect, or a sanctuary to entertain him, or to protect or entertain his children when he is gone. Though he should have little else to leave them, he bequeaths them the fairest, and generally the most unenvied inheritance of a good name, which, like good seed sown in the field of futurity, will often raise up unsolicited friends, and yield a benevolent harvest of unexpected charities. But should the fragrance of the parent's virtue prove offensive to a perverse or envious age, or even draw persecution on the friendless orphans, there is One in heaven who will be more than a father to them, and recompense their parent's virtues by showering down blessings on them.

CHAP. III.—MOTIVES TO VIRTUE FROM THE BEING AND PROVIDENCE OF GOD.

Eternal motives to virtue.

Besides the interesting incentive mentioned in the last chapter, there are two great motives to virtue strictly connected with human life, and resulting from the very constitution of the human mind. The first is the *being and providence of God*; the second is the *immortality of the soul*, with future rewards and punishments.

It appears (from chap. iv. of part ii.) that man, by the constitution of his nature, is designed to be a *religious creature*. He is intimately connected with the Deity, and necessarily dependent on him. From that connection and necessary dependence result various obligations and duties, without fulfilling which some of his most sublime powers and affections would be incomplete and abortive. If he be likewise an *immortal* creature, and if his present conduct shall affect his future happiness in another state as well as in the present, it is evident that we take only a partial view of the creature if we leave out this important property of his nature, and make a partial estimate of human life if we strike out of the account, or overlook, that part of his duration which runs out into eternity.

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It is evident, from the above-mentioned chapter, that to have a respect to the Deity in our temper and conduct, to venerate and love his character, to adore his goodness, to depend upon and resign ourselves to his providence, to seek his approbation, and act under a sense of his authority, is a fundamental part of moral virtue, and the completion of the highest destination of our nature. But as piety is an essential part of virtue, so likewise it is a great support and enforcement to the practice of it. To contemplate and admire a being of such transcendent dignity and perfection as God, must naturally and necessarily open and enlarge the mind, give a freedom and ampleness to its powers, and a grandeur and elevation to its aims. For, as an excellent divine observes, the greatness of an object, and the excellency of the act of any *agent* about a transcendent object, doth mightily tend to the enlargement and improvement of his faculties. Little objects, mean company, mean cares, and mean business, cramp the mind, contract its views, and give it a creeping air and deportment. But when it soars above mortal cares and mortal pursuits, into the regions of divinity, and converses with the greatest and best of beings, it spreads itself into a wider compass, takes higher flights in reason and goodness, and becomes godlike in its air and manners. Virtue is, if one may say so, both the effect and the cause of enlargement of mind. It requires that one should think freely, and act nobly. Now what can conduce more to freedom of thought and dignity of action than to conceive worthily of God, to reverence and adore his unrivalled excellence, to imitate and transcribe that excellence into our own nature, to remember our relation to him, and that we are the images and representatives of his glory to the rest of the creation? Such feelings and exercises must and will make us scorn all actions which are base, unhandsome, or unworthy our state; and the relation we stand in to God will irradiate the mind with the light of wisdom, and ennoble it with the liberty and dominion of virtue.

The influence and efficacy of religion may be considered in another light. We all know that the presence of a friend, a neighbour, or any number of spectators, but especially an august assembly of them, operates as a considerable check upon the conduct of one who is not lost to all sense of honour and shame, and contributes to restrain many irregular sallies of passion. In the same manner, we may imagine, that the awe of some superior mind, who is supposed to be privy to our secret conduct, and armed with full power to reward or punish it, will impose a restraint on us in such actions as fall not under the control or animadversion of others. If we go still higher, and suppose our inmost thoughts and darkest designs, as well as our most secret actions, to lie open to the notice of the Supreme and Universal Mind, who is both the spectator and judge of human actions, it is evident that the belief of so august a presence, and such awful inspection, must carry a restraint and weight with it proportioned to the strength of that belief, and be an additional motive to the practice of many duties which would not have been performed without it.

It may be observed further, that to live under an habitual sense of the Deity and his great administration, is to be conversant with wisdom, order, and beauty, in the highest subjects, and to receive the delightful reflections and benign feelings which these excite whilst they radiate upon him from every scene of nature and providence. How improving must such views be to the mind, in dilating and exalting it above those puny interests and competitions which agitate and inflame the bulk of mankind against each other.

CHAP. IV.—MOTIVE TO VIRTUE FROM THE IMMORTALITY OF THE SOUL.

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Metaphysical arguments for the immortality of the soul.

The other motive mentioned was the immortality of the soul, with future rewards and punishments. The metaphysical proofs of the soul's immortality are commonly drawn from its simple, uncompounded, and indivisible nature, whence it is concluded that it cannot be corrupted or extinguished by a dissolution or destruction of its parts; from its having a beginning of motion within itself, whence it is inferred that it cannot discontinue and lose its motion; from the different properties of matter and mind, the sluggishness and inactivity of the one, and the immense activity of the other, its prodigious flight of thought and imagination, its penetration, memory, foresight, and anticipations of futurity, whence it is concluded that a being of so divine a nature cannot be extinguished. But as these metaphysical proofs depend upon intricate reasonings concerning the nature, properties, and distinctions of body and mind, with which we are not very well acquainted, they are not obvious to ordinary understandings, and are seldom so convincing even to those of higher reach, as not to leave some doubts behind them. Therefore perhaps it is not so safe to rest the proof of such an important article upon what many may call the subtilties of school learning. Those proofs which are brought from analogy, from the moral constitution and phenomena of the human mind, the moral attributes of God, and the present course of things, and which therefore are called the moral arguments, are the plainest and generally the most satisfying. We shall select only one or two from the rest.

Moral proof from analogy.

In tracing the nature and destination of any being, we form the surest judgment from his powers of action, and the scope and limits of these, compared with his state, or with that field in which they are exercised. If this being passes through different states, or fields of action, and we find a succession of powers adapted to the different periods of his progress, we conclude that he was destined for those successive states, and reckon his nature progressive. If, besides the immediate set of powers which fit him for action in his present state, we observe another set which appear superfluous if he were to be confined to it, and which point to another or higher one, we naturally conclude, that he is not designed to remain in his present state, but to advance to that for which those supernumerary powers are adapted. Thus we argue, that the insect, which has wings forming or formed, and all the apparatus proper for flight, is not destined always to creep upon the ground, or to continue in the torpid state of adhering to a wall, but is designed in its season to take its flight in air. Without this further destination, the admirable mechanism of wings and the other apparatus would be useless and absurd. The same kind of reasoning may be applied to man, whilst he lives only a sort of vegetative life in the womb. He is furnished even there with a beautiful apparatus of organs, eyes, ears, and other delicate senses, which receive nourishment, indeed, but are in a manner folded up, and have no proper exercise or use in their present confinement.[1] Let us suppose some intelligent spectator, who never had any connection with man, nor the least acquaintance with human affairs, to see this odd phenomenon, a creature formed after such a manner, and placed in a situation apparently unsuitable to such various machinery: must he not be strangely puzzled about the use of his complicated structure, and reckon such a profusion of art and admirable workmanship lost on the subject; or reason by way of anticipation, that a creature endowed with such various yet unexerted capacities, was destined for a more enlarged

[1] Ludov. Viv. *de Religione Christi*, lib. ii.

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sphere of action, in which those latent capacities shall have full play? The vast variety and yet beautiful symmetry and proportions of the several parts and organs with which the creature is endowed, and their apt cohesion with, and dependence on, the curious receptacle of their life and nourishment, would forbid his concluding the whole to be the birth of chance, or the bungling effort of an unskilful artist; at least would make him demur a while at so harsh a sentence. But if, whilst he is in this state of uncertainty, we suppose him to see the babe, after a few successful struggles, throwing off his fetters, breaking loose from his little dark prison, and emerging into open day, then unfolding his recluse and dormant powers, breathing air, gazing at light, admiring colours, sounds, and all the fair variety of nature, immediately his doubts clear up, the propriety and excellency of the workmanship dawn upon him with full lustre, and the whole mystery of the first period is unravelled by the opening of this new scene. Though in this second period the creature lives chiefly a kind of animal life, that is, a life of sense and appetite, yet by various trials and observations he gains experience, and by the gradual evolution of the powers of imagination he ripens apace for a higher life, for exercising the arts of design and imitation, and of those in which strength or dexterity are more requisite than acuteness or reach of judgment. In the succeeding rational or intellectual period, his understanding, which formerly crept in a lower, mounts into a higher sphere, canvasses the nature and judges of the relations of things, forms schemes, deduces consequences from what is past, and from present as well as past collects future events. By this succession of states, and of correspondent culture, he grows up at length into a moral, a social, and a political creature. This is the last period at which we perceive him to arrive in this his mortal career. Each period is introductory to the next succeeding one; each life is a field of exercise and improvement for the next higher one; the life of the fœtus for that of the infant, the life of the infant for that of the child, and all the lower for the highest and best.[1] But is this the last period of nature's progression? Is this the utmost extent of her plot, where she winds up the drama, and dismisses the actor into eternal oblivion? Or does he appear to be invested with supernumerary powers, which have not full exercise and scope even in the last scene, and reach not that maturity and perfection of which they are capable; and therefore point to some higher scene, where he is to sustain another and more important character than he has yet sustained? If any such there are, may we not conclude by analogy, or in the same way of anticipation as before, that he is destined for that after part, and is to be produced upon a more august and solemn stage, where his sublimer powers shall have proportioned action, and his nature attain its completion?

Powers in man which point to an after life.

If we attend to that curiosity, or prodigious thirst of knowledge, which is natural to the mind in every period of its progress, and consider withal the endless round of business and care, and the various hardships, to which the bulk of mankind are chained down, it is evident, that in this present state it is impossible to expect the gratification of an appetite at once so insatiable and so noble. Our senses, the ordinary organs by which knowledge is let into the mind, are always imperfect, and often fallacious; the advantages of assisting or correcting them are possessed by few; the difficulties of finding out truth amidst the various and contradictory opinions, interests, and passions of mankind, are many; and the wants of the creature, and of those with whom he is connected, numerous and urgent; so that it may be said of most men, that their intellectual organs are as much shut up and secluded from proper nourishment and exercise in that little circle to which they are confined, as the bodily organs are in the womb. Nay, those who to an aspiring genius have added all the assistances of art, leisure, and the most liberal education, what narrow prospects can even they take of this unbounded scene of things from that little eminence on which they stand? and how eagerly do they still grasp at new discoveries, without any satisfaction or limit to their ambition?

Motives to Virtue.

Moral powers.

But should it be said that man is made for action, and not for speculation, or fruitless searches after knowledge, we ask, for what kind of action? Is it only for bodily exercises, or for moral, political, and religious ones? Of all these he is capable; yet, by the unavoidable circumstances of his lot, he is tied down to the former, and has hardly any leisure to think of the latter, or, if he has, wants the proper instruments of exerting them. The love of virtue, of one's friends and country, the generous sympathy with mankind, and heroic zeal of doing good, which are all so natural to great and good minds, and some traces of which are found in the lowest, are seldom united with proportional means or opportunities of exercising them; so that the moral spring, the noble energies and impulses of the mind, can hardly find proper scope even in the most fortunate condition, but are much depressed in some, and almost entirely restrained in the generality, by the numerous clogs of an indigent, sickly, or embarrassed life. Were such mighty powers, such godlike affections, planted in the human breast to be folded up in the narrow womb of our present existence, never to be produced into a more perfect life, nor to expatiate in the ample career of immortality?

Unsatisfied desires of existence and happiness.

Let it be considered, at the same time, that no possession, no enjoyment, within the round of mortal things, is commensurate to the desires or adequate to the capacities of the mind. The most exalted condition has its abatements; the happiest conjuncture of fortune leaves many wishes behind; and, after the highest gratifications, the mind is carried forward in the pursuit of new ones without end. Add to all, the fond desire of immortality, the secret dread of non-existence, and the high unremitting pulse of the soul beating for perfection, joined to the improbability or the impossibility of attaining it here; and then judge whether this elaborate structure, this magnificent apparatus of inward powers and organs, does not plainly point out an hereafter, and intimate eternity to man. Does nature give the finishing touches to the lesser and ignoble instances of her skill, and raise every other creature to the maturity and perfection of his being; and shall she leave her principal workmanship unfinished? Does she carry the vegetative and animal life in man to their full vigour and highest destination; and shall she suffer the intellectual, moral, and divine life of man to fade away, and be for ever extinguished? Would such abortions in the moral world be congruous to that perfection of wisdom and goodness which upholds and adorns the natural?

We must therefore conclude from this detail, that the present state, even at its best, is only the *womb* of man's being, in which the noblest principles of his nature are in a manner fettered, or secluded from a correspondent sphere of action, and therefore destined for a future and unbounded state, where they shall emancipate themselves, and exert the fulness of their strength. The most accomplished mortal in this low and dark apartment of nature is only the rudiments of what he shall be when he takes his ethereal flight, and puts on immortality. Without a reference to that state, man were a mere abortion, a rude unfinished

[1] Butler's Analogy, part i.

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embryo, a monster in nature. But this being once supposed, he still maintains his rank as the masterpiece of the creation; his latent powers are all suitable to the harmony and progression of nature; his noble aspirations, and the pains of his dissolution, are his efforts towards a second birth, the pangs of his delivery into light, liberty, and perfection; and death, his discharge from gaol, his separation from his fellow-prisoners, and introduction into the assembly of those heroic spirits who are gone before him, and the presence of their great eternal Parent. The fetters of his mortal coil being loosened, and his prison walls broken down, he will be bare and open on every side to the admission of truth and virtue, and their fair attendant, happiness; every vital and intellectual spring will evolve itself with a divine elasticity in the free air of heaven. He will not then peep at the universe and its glorious Author through a dark grating or a gross medium, nor receive the reflections of his glory through the strait openings of sensible organs, but will be all eye, all ear, all ethereal and divine feeling.[1] Let one part, however, of the analogy be attended to. As in the womb we receive our original constitution, form, and the essential stamina of our being, which we carry along with us into the light, and which greatly affect the succeeding periods of our life; so our temper and condition in the future life will depend on the conduct we have observed, and the character we have formed, in the present state. We are here in miniature what we shall be at full length hereafter. The first rude sketch or outline of reason and virtue must be drawn at present, to be afterwards enlarged to the stature and beauty of angels.

Immortality a guard and incentive to virtue.

This, if duly attended to, must prove not only a guard, but an admirable incentive, to virtue. For he who faithfully and ardently follows the light of knowledge, and pants after higher improvements in virtue, will be wonderfully animated and inflamed in that pursuit by a full conviction that the scene does not close with life; that his struggles, arising from the weakness of nature and the strength of habit, will be turned into triumphs; that his career in the track of wisdom and goodness will be both swifter and smoother; and those generous ardours with which he glows towards heaven, or the perfection and immortality of virtue, will find their adequate object and exercise in a sphere proportionally enlarged, incorruptible, immortal. On the other hand, what an inexpressible damp must it be to the good man to dread the total extinction of that light and virtue, without which life, nay, immortality itself, were not worth a single wish?

Proof from the inequality of present distributions.

Many writers draw their proofs of the immortality of the soul, and of a future state of rewards and punishments, from the unequal distribution of these here. It cannot be dissembled that wicked men often escape the outward punishment due to their crimes, and do not feel the inward in that measure which their demerit seems to require, partly from the callousness induced upon their nature by the habits of vice, and partly from the dissipation of their minds abroad by pleasure or business; and sometimes good men do not reap all the natural and genuine fruits of their virtue, through the many unforeseen or unavoidable calamities in which they are involved. To the smallest reflection, however, it is obvious that the natural tendency of virtue is to produce happiness; that if it were universally practised, it would, in fact, produce the greatest sum of happiness of which human nature is capable; and that this tendency is defeated only by numerous individuals, who, forsaking the laws of virtue, injure and oppress those who steadily adhere to them. But the natural tendency of virtue is the result of that constitution of things which was established by God at the creation of the world. This being the case, we must either conclude, that there will be a future state, in which all the moral obliquities of the present shall be made straight; or else admit, that the designs of infinite wisdom, goodness, and power, can be finally defeated by the perverse conduct of human weakness. But this last supposition is so extravagantly absurd, that the reality of a future state, the only other possible alternative, may be pronounced to have the evidence of perfect demonstration.

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Belief of immortality a great support amidst trials.

Virtue has present rewards, and vice present punishments, annexed to them—such rewards and punishments as make virtue, in most cases that occur, far more eligible than vice; but, in the infinite variety of human contingencies, it may sometimes happen, that the inflexible practice of virtue shall deprive a man of considerable advantages to himself, his family, or friends, which he might gain by a well-timed piece of roguery; suppose by betraying his trust, voting against his conscience, selling his country, or any other crime where the security against discovery shall heighten the temptation. Or, it may happen, that a strict adherence to his honour, to his religion, to the cause of liberty and virtue, shall expose him or his family to the loss of every thing, nay, to poverty, slavery, death itself, or to torments far more intolerable. Now, what shall secure a man's virtue in circumstances of such trial? What shall enforce the obligations of conscience against the allurements of so many interests, the dread of so many and so terrible evils, and the almost unsurmountable aversion of human nature to excessive pain? The conflict is the greater when the circumstances of the crime are such as easily admit a variety of alleviations from necessity, natural affection, love to one's family or friends, perhaps in indigence; these will give it even the air of virtue. Add to all, that the crime may be thought to have few bad consequences, may be easily concealed, or imagined possible to be retrieved in a good measure by future good conduct. It is obvious to which side most men will lean in such a case; and how much need there is of a balance in the opposite scale, from the consideration of a God, of a Providence, and of an immortal state of retribution, to keep the mind firm and uncorrupted in those or similar instances of singular trial or distress.

But without supposing such peculiar instances, a sense of a governing Mind, and a persuasion that virtue is not only befriended by him here, but will be crowned by him hereafter with rewards suitable to its nature, vast in themselves, and immortal in their duration, must be not only a mighty support and incentive to the practice of virtue, but a strong barrier against vice. The thoughts of an Almighty Judge, and of an impartial future reckoning, are often alarming, indeed inexpressibly so, even to the stoutest offenders. On the other hand, how supporting must it be to the good man, to think that he acts under the eye of his friend, as well as judge. How improving, to consider the present state as connected with a future one, and every relation in which he stands as a school of discipline for his affections; every trial as the exercise of some virtue; and the virtuous deeds which result from both, as introductory to higher scenes of action and enjoyment. Finally, how transporting is it to view death as his discharge from the warfare of mortality, and a triumphant entry into a state of freedom, and security, and perfection, in which knowledge and wisdom shall break in upon him from every quarter; where each faculty shall have its proper object; and where his virtue, which was often damped or defeated here, shall be enthroned in undisturbed and eternal empire.

(H. H. H. H.)

[1] Religion of Nature Delineated, sect. 9.

Moral Sense ‖ Moravia.

MORAL SENSE, that by which we perceive what is good, and virtuous, and beautiful, in actions, manners, and characters. See MORAL PHILOSOPHY.

MORASS, a marsh, fen, or low moist ground, which receives the waters from above without having any outlet to carry them off again. Somner derives the word from the Saxon *merse*, lake; Salmasius from *mare*, a collection of waters; others from the German *marast*, a muddy place; and others again from *maresc*, an abbreviation of *maricetum*, *a mariscis*, rushes. In Scotland, Ireland, and the north of England, there is a particular kind of morasses called *mosses*, or *peat-mosses*, whence the country people dig their peat or turf for fuel.

MORAVIA, one of those larger divisions of the Austrian empire which has been formed out of the ancient margravate of that name, to which has been joined that portion of Silesia which remained under the Austrian dominion after the cessions extorted from it by Frederick the Great of Prussia. This province is bounded on the north-west by Bohemia, on the north-east by Prussian Silesia, on the east by Gallicia, on the south-east by Hungary, and on the south-west by the province of the Lower Ens. It has nearly the form of a square, the four angles of which point to the four quarters of the compass. It is situated between 15° 6′ and 19° 1′ east longitude, and between 48° 41′ and 50° 25′ north latitude. It extends over 10,593 square miles, and comprehends 119 cities or places once fortified, 178 market-towns, and 3672 villages, inhabited in 1822 by 1,890,706 souls, in 1830 by 2,060,000 and in 1834 by 2,110,140. Moravia is generally a hilly country. The Carpathian Mountains, which separate it from Hungary, send into it many of their projections; and besides these, some of the Bohemian and Silesian ranges are extended through various parts of it, whilst in the more southern parts extensive plains are to be seen, which stretch towards the Danube. In the more hilly parts the valleys between are wide, well watered by rivulets, and covered with a rich verdure, presenting pictures of rural comfort and abundance. The greater part of Moravia is between 400 and 950 feet above the level of the sea; and by the sloping of the land, the waters are discharged into rivers, which finally terminate in the German Ocean, in the Baltic, and the Black Sea. The Elbe performs the office of conveying the streams to the first, the Oder and the Vistula to the second, and the Danube to the last of those seas. The greatest body of water, however, passes by the Danube, which receives the river Morawa, from which the province takes its name. The Vistula rises on the confines of the province, and quits it before it becomes a considerable stream, unless at the season when the melting of the snow on the Carpathian Mountains fills a broad channel, and at other times nearly dry. There are no lakes in Moravia, but many stagnant pools and dikes, especially in the circle of Znaym, which yield vast quantities of freshwater fish.

The climate of Moravia is peculiarly mild and salubrious, and the cold less severe than in any other part of the Continent in the same degree of latitude. This is attributed to the protection from the easterly and northerly winds which the lofty Carpathian Mountains afford. The vine is cultivated, and wine produced as high as latitude 49° 15′; and the harvest in Moravia is generally five or six weeks earlier than in the Prussian province of Silesia which adjoins it.

This province is, with the exception of the Italian dominions, the best cultivated, the most densely peopled, and the most productive, of any part of the Austrian empire. About two fifths of the land is under the plough, one fifth is woodland, and the rest is either meadows, upland pasture, or gardens and vineyards. Although the northern part, formerly Silesia, is naturally a poor soil for corn, yet the whole of the province yields more than is required for consumption. Both hemp and flax are produced in great quantities, and the quality is reported to be excellent. From want of good water conveyance, the woods are made valuable by furnishing much pot and pearl ashes. The northern part is best adapted for the dairy; the breed of cows is good, and yields much butter and cheese. The number of them is nearly equal to that of the sheep, which animals have not yet had so much attention paid to the improvement of their wool as in the adjoining districts of Prussia, or as has been devoted to it in some other parts of Austria. Moravia.

The horses, excepting in those parts where they have been improved by a mixture with the Bohemian breed, are small in size and not strong; but pains are taking to improve the race by the introduction of stallions of more power and better forms. Swine, geese, and bees, are objects of rural attention, and yield considerable profit.

There are some mines of iron worked, as there were formerly of gold, silver, and lead; but these were injured by the wars which broke out against the followers of Huss the Protestant reformer, most of whose adherents were persons who worked in the rich mines. It is only of late years that the silver mines have altogether ceased. At present about 2000 tons of iron are procured. There are also some alum mines, yielding about 800 tons of that substance; and there are mines of coal and of sulphur.

Moravia is the chief manufacturing district of the empire. The woollen cloth manufacture gives employment to more than 100,000 persons, and yields annually more than 50,000 pieces of fine cloths, and 220,000 pieces of cloth of inferior quality, besides flannels, baizes, and blankets. The cotton trade employs more than 10,000 workmen, and in that branch of industry the machinery invented in other countries has been extensively introduced. The linen trade is a domestic employment which occupies the spare hours of most females in spinning; and in that and subsequent steps it is stated to afford the means of subsistence to more than 250,000 persons, who produce upwards of 500,000 pieces of cloth yearly, from the coarsest canvass to the first damask table-linen and lawns. With this branch is joined the making of twine and of cordage. Hosiery is also a considerable branch of industry, yielding stockings, caps, and net, both by the hand and from knitting. There are fabrics of paper, glass, hats, cutlery, hardware, china, and earthenware, snuff-mills, and very extensive tanneries. Few countries are so generally well supplied from their own labour with all that is required by the state of their society. The trade is chiefly with the surrounding districts of the same empire, from which, in exchange for its native productions, it obtains silk goods, tobacco, sugar, coffee, salt, and foreign luxuries.

The inhabitants consist of two races, distinguished by their difference of language. About three fourths of them are of the great Sclavonian family, divided into four branches, but all with different dialects, using a language originating, like the Polish and Bohemian, from that of the Slavi. These occupy all the most fertile districts. The Germans are about one fourth of the population, and consist of both high and low, and Austrians, each using its own patois. The prevailing religion is that of the Roman Catholic church, but the other sects are also established. The Hussite Protestants once formed a much larger proportion of the inhabitants than they do at present. A body of that persuasion under Count Zinzendorf were formed into a colony in Saxony, whence, under the name of Herrnhutters, they have spread over the northern part of Europe, whilst some communities have been formed by them in England, where they are commonly called Moravians, but by themselves are distinguished as the United Brethren. The non-catholic portion of the population at present consists of 54,000 Luthe-

Moravia || Moray-shire.

rans, 14,000 Calvinists, and 28,000 Jews. The institutions for education are on a low scale. There is a Lyceum at Olmutz, and many inferior schools, to the support of which the estates of the abolished society of the Jesuits have been appropriated.

Moravia, from the end of the fourteenth century, was an independent principality, sometimes under the protection of Hungary, at other times under that of Bohemia, and had its own states and margraves. In 1526 it came under the government of the sovereigns of Austria, and has continued so till this time. The states no longer assemble, nor have they done so since 1627. The chief board of government is held at Brunn, where are the supreme courts, both of civil and criminal law. As nearly as can be ascertained, the revenue drawn from the present Moravian province does not exceed L.750,000 sterling annually; but besides this, it furnishes recruits for five regiments of infantry, two of cavalry, and three of artillery.

MORAVIA, a river of Turkey in Europe, which rises in Bulgaria, runs north through Servia by Nissa, and falls into the Danube at Semendria, to the eastward of Belgrade.

MORAYSHIRE, or MURRAYSHIRE, a county in Scotland. The province of Moray formerly included part of the shires of Inverness and Banff, and that of Nairn, besides the present county; but the name is now confined to this district, which is also known by the appellation of Elginshire. It is situated between 57° 12′ and 57° 43′ north latitude, and between 3° 2′ and 3° 58′ west longitude, extending about forty miles from north-east to south-west, and in breadth from eight to fourteen miles in the interior, but upon the coast from seventeen to twenty-three miles; and it contains, including its lakes, 480 square miles, or 307,200 English acres, of which only about one third is productive land. The county of Moray has the frith of that name on the north, Banffshire on the east, Inverness-shire on the south, and Nairnshire on the west. The river Spey, which, with a few exceptions, separates it from Banffshire, is commonly considered as its eastern boundary. On the south, it is intersected by a small part of Inverness-shire, by which two parishes, Abernethy and Duthil, partly in this county, are detached from the body of it. It is divided into fifteen entire parishes, and contains part of nine more parishes, the rest of which are situated in the counties adjacent. The presbyteries to which these parishes belong are, Aberlour, Abernethy, Elgin, and Forres, all under the jurisdiction of the synod of Moray.

The natural divisions are the low grounds which stretch along the coast, varying in breadth, southward, from five to twelve miles, and the mountains which occupy the interior; yet the former is not without ridges of hills, though of no great height, which generally rise in a line parallel to the shore; nor the latter without considerable tracts of low land, particularly on the branches of the Spey and Findhorn, and the other streams which flow from the south. The climate, soil, and productiveness of these two divisions are very different. The climate on the coast is supposed to be as good as that of any part of Scotland, both in respect to heat and to dryness; whilst the prevailing soil is a sandy loam, in many parts affording plentiful crops, which ripen early, and are seldom injured by bad weather in the harvest season. The wind blows from westerly points for almost three fourths of the year. The strong gales are from the north-west, and the most frequent rains are from this point and the north. Easterly winds, however, prevail in the spring months, to the great injury of vegetation. The annual fall of rain upon the north-east quarter, near Speymouth, is said to be little more than twenty-five inches; and the medium temperature of the year varies from 45° to 50°. In the mountain district, the winters are long and severe; more rain falls than on the coast; and the labours of the harvest are sometimes not brought to a close until the crops are covered with snow. Limestone, sandstone, and slate, with marl, abound in various parts. Iron was almost a century ago wrought in Strathspey by the York Buildings Company, and lead at Stotfield by an English company. Lime is quarried and burned at six different places. The rivers are the Spey, the Lossie, and the Findhorn, which receive the waters of a great many mountain streams. The Spey, the most considerable, has a course of thirty miles before it enters Morayshire, at Aviemore, from which it flows in a deep channel, and with a considerable fall, till it empties itself, after describing a line of about ninety-six miles in all, into the sea at Speymouth Bay. It is not navigable, except near its mouth, and there only for small vessels; but it affords the means of bringing down to the sea the forests on its banks; and the rents of its salmon fisheries, some years ago, exceeded L.8000 per annum. The Lossie flows almost parallel to the Spey, about ten miles distant, and, after a course of twenty-four miles, during which it turns a number of corn mills, falls into the sea at Lossiemouth, about six miles to the north of Elgin. The Findhorn, like the two former, flows from south to north, and enters the Frith of Moray at the village that bears its name, having traversed Inverness-shire, where it has its source, Nairnshire, and this county, for a distance of sixty miles. There is also a valuable salmon fishery on this river. The principal lakes, beginning on the east, are Loughnaboe, which covers about sixty acres; Loch Spynie, which formerly spread over more than 2000 acres, but has since been laid almost dry by drainage; Inchstellie, Lochloy, and Loughnadurb, containing an island on which there are the remains of an ancient fortress, and where it is said turnips have been found growing naturally. Chalybeate springs are found in every quarter of the county, but none of them are in much repute.

Moray-shire.

The valued rent of Morayshire, in Scotch money, is L.65,603. 0s. 5d., and the real rent, in 1811, of the lands, was L.62,312. 9s. 6d. sterling, and of the houses, L.2753. 14s. 6d. In the same year, the number of proprietors was forty-one, five of whom held more than half the valuation and rental; and that of the freeholders thirty-six. Only about a fortieth part is held in feu, the whole, with this exception, and small portions belonging to the burghs, being freehold; but nearly a third is under entail. Many of the proprietors have elegant mansions, of which the most considerable, beginning on the eastern quarter, are Innes House, the Earl of Fife; Findrassie, Tod; Gordonstown and Altyre, Cumming Gordon, Bart.; Duffus, Dunbar, Bart.; Darnway Castle, the Earl of Moray; Brodie House, Brodie; Grange, Grant Peterkin; Burgie Castle, Tulloh; and Elchies House, Grant.

The size of farms on the coast does not often exceed 400 acres, and the greater number are below 150 acres. The larger farms are generally held on leases of nineteen years, as in other parts of Scotland, but many of the smaller tenants have no leases. This division of the county produces all the species of corn grown in Scotland, with turnips, potatoes, and clovers. In the higher district, barley and oats, along with potatoes, are almost the only crops, with small portions of turnips and cultivated herbage, and in some places a little flax. The native cattle have been improved by crossing them with the West Highland race; and of late years, through the exertions of a local Tanning Society, crosses from the short-horned Teeswater and Aberdeenshire breeds have been introduced, which have much increased the size of stock and aptitude to fatten, thereby insuring to the agriculturists a fertile source of profit and advantage, from the ready communication with the London markets, afforded by steam-vessels, which now regularly navigate the Moray Frith. The sheep, which

Morbihan ‖ Morbus Comitialis.

were originally similar to those of Zetland, have given way to the Cheviot and black-faced on the hills, and Leicester and South Downs on the lowland farms. Upon the larger farms on the coast the horses are of the very best description, and even in the higher districts they are not inferior to those of other parts of Scotland.

The great stimulus given to the agricultural interest in the production of stock, corn, and smaller commodities, for the London market, has incited corresponding exertions in the owners of harbours along the coast to facilitate export. Those of Findhorn and Burghead have of late been much improved by the construction of additional quays; and a new harbour is at present (1837) erecting at Stotfield Point, within six miles of Elgin, which is expected to be of very great advantage to the surrounding district.

This county contains within its bounds two of the noblest forests in Scotland, viz. Abernethy Forest, of Scotch fir, and Darnaway Forest, chiefly oak of ancient growth. There are also extensive recent plantations along the banks of the rivers Spey and Findhorn at Fochabers, Quarry Wood, &c.; and the district generally is beautifully diversified and sheltered by thriving clumps, belts, and hedgerows.

Mordaunt.

Morayshire employs few of its people in manufactures for sale. A woollen factory has been established at Newmill, in the parish of St Andrews Lhanbryd; and in the same quarter another for the weaving of cottons. There are tanneries at Forres and Elgin; and, at the latter place, a tawing work of some consideration, which sends most of its produce to London. The exports are cattle, sheep, wool, corn, and salmon, with a variety of smaller articles. The value of the salmon has been stated at about L.25,000, and that of the other exports at L.80,000 yearly. A considerable quantity of timber is floated down the Spey, and shipped at Garmouth. The towns and villages are, Elgin the county town, Forres, Garmouth, Urquhart, Lossiemouth, Bishopmill, Findhorn, Rothes, and Balnatom. The first two are burghs; Elgin is joined with Cullen, Banff, Peterhead, Inverury, and Kintore, and Forres with Inverness, Nairn, and Fortrose, in the election of members for the Scottish burghs. Both these places are of great antiquity. The population in 1811, 1821, and 1831 is exhibited in the following abstract.

YEAR.	HOUSES.			OCCUPATIONS.			PERSONS.		
	Inhabited.	By how many Families occupied.	Uninhabited.	Families chiefly employed in Agriculture.	Families chiefly employed in Trade, Manufactures, or Handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.
1811	6268	6854	197	2635	1886	2333	12,401	15,707	28,108
1821	6668	7327	162	2676	2330	2321	14,292	16,870	31,162
1831	6919	7768	226	2605	2340	2823	15,779	18,452	34,231

Constituencies in 1836:—County, 611 voters; burgh of Elgin, 232; burgh of Forres, 147.

MORBIHAN, a department of the north-west of France, formed out of a portion of Lower Bretagne, and deriving its name from a shallow bay to the south of Vannes. It extends in west longitude from 2. 11. to 3. 55., and in north latitude from 47. 17. to 48. 14. It is bounded on the north by the department of the North Coasts, on the east by that of Ille-Vilaine, on the south by that of the Lower Loire and the ocean, and on the west by Finisterre. It contains 2598 square miles, or 699,641 hectares, and is divided into four arrondissements, thirty-seven cantons, and 228 communes, and in 1836 the inhabitants were 449,743, who for the most part speak a language nearly resembling that of Wales, but who are backward in all improvements, and live mostly in scattered villages or insulated small farms. The soil on the whole is fertile, and, in spite of a very negligent state of agriculture, produces a small surplus of the common grains, as well as butter, cheese, honey, and cattle, for exportation. The cultivation of hemp and flax is extensive, and the conversion of these plants into cloth forms the chief employment of the inhabitants. The fishery on the coast affords occupation to numerous persons, and some are engaged in producing both cast and hammered iron. The department, from the scarcity of wood, has much to suffer from the want of fuel. It sends four deputies to the legislature. The capital is the city of Vannes, which, in 1836, contained 11,623 inhabitants.

MORBUS COMITIALIS, a name given to the epilepsy, because, if on any day when the Roman people were assembled in *comitia* upon public business, any person fell down suddenly seized with this disorder, the assembly was dissolved, and the business of the *comitia*, however important, suspended.

MORDAUNT, CHARLES, Earl of Peterborough, a celebrated commander both by sea and land, was the son of John Lord Mordaunt Viscount Avalon, and was born about the year 1658. In 1675 he succeeded his father in his honours and estate. Whilst yet a young man, he served under Admirals Torrington and Narborough in the Mediterranean against the Algerines; and in the year 1680 embarked for Africa with the Earl of Plymouth, and distinguished himself at Tangier when it was besieged by the Moors. In the reign of James II. he voted against the repeal of the test act, and, disliking the measures of the court, obtained leave to repair to Holland in order to accept the command of a Dutch squadron in the West Indies. He afterwards accompanied the Prince of Orange into this kingdom, and upon his advancement to the throne was sworn a member of the privy council, made one of the lords of the bedchamber to his majesty, and first commissioner of the treasury, and advanced to the dignity of the Earl of Monmouth. But in November 1690 he was dismissed from his post in the treasury. On the death of his uncle Henry Earl of Peterborough, in 1697, he succeeded to that title; and, upon the accession of Queen Anne, he was invested with the commission of captain-general and governor of Jamaica. In 1705 he was sworn a member of the privy council, and the same year declared general and commander-in-chief of the forces in Spain, and joint admiral with Sir Cloudesley Shovel of the fleet, of which the year following he received the undivided command. His taking Barcelona with a handful of men, and afterwards relieving it when greatly distressed by the enemy; his driving out of Spain the Duke of Anjou and the French army, which consisted of twenty-five thousand men, though his own troops never amounted to ten thou-

More. sand; his gaining possession of Catalonia, of the kingdoms of Valencia and Aragon, and of the island of Majorca, with part of Murcia and Castille, and thereby giving theEarl of Galway an opportunity of advancing to Madrid without a blow; are astonishing instances of his bravery and conduct. For these important services his lordship was declared general in Spain by Charles III. afterwards emperor of Germany; and on his return to England he received the thanks of the House of Lords. His lordship was afterwards employed in several embassies to foreign courts, installed knight of the Garter, and made governor of the island of Minorca. In the reign of George I. he was general of the marine forces of Great Britain, and he was continued in this post by King George II. He died in his passage to Lisbon, whither he was proceeding for the recovery of his health, in 1735. His lordship was distinguished by various shining qualities. To the greatest personal courage and resolution he added all the arts and address of a general; a lively and penetrating genius, and a great extent of knowledge upon almost every subject of importance within the compass of ancient and modern literature.

MORE, Sir Thomas, Lord High Chancellor of England, was the son of Sir John More, knight, one of the judges of the King's Bench, and born in the year 1480, in Milk Street, London. He was first sent to a school at St Anthony's, in Threadneedle Street, and afterwards introduced into the family of Cardinal Moreton, who in 1497 sent him to Canterbury College, Oxford. During his residence at the university he constantly attended the prelections of Linacre and Grocinus, upon the Greek and Latin languages. Having in about two years made considerable proficiency in academical learning, he came to New Inn, in London, to study the law; and, after some time, he removed thence to Lincoln's Inn, of which his father was a member. Notwithstanding his application to the law, however, being now about the age of twenty, he was so attached to monkish discipline, that he wore a hair shirt next his skin, practised frequent fastings, and often slept on a bare plank. In the year 1503, being then a burgess in parliament, he distinguished himself in the house, in opposition to the motion for granting a subsidy and three fifteenths for the marriage of Henry VII.'s eldest daughter, Margaret, to the king of Scotland. The motion was rejected, and the king was so highly offended at this opposition from a beardless boy, that he revenged himself on More's father, by sending him, on a frivolous pretence, to the Tower, and obliging him to pay L.100 for his liberty. Being now called to the bar, More was appointed law-reader at Furnival's Inn, which place he held during three years; but about this time he also delivered, with great applause, a public lecture in the Church of St Lawrence, Old Jewry, upon St Augustin's treatise *De Civitate Dei*. He had, indeed, formed a design of becoming a Franciscan friar, but he was dissuaded from carrying it into effect; and, by the advice of Dr Colet, he married Jane, the eldest daughter of Mr John Colt of Newhall, in the county of Essex. In 1508 he was appointed judge of the Sheriff's Court in the city of London, was made a justice of the peace, and became eminent at the bar. In 1516 he went to Flanders in the retinue of Bishop Tonstal and Dr Knight, who were sent by Henry VIII. to renew the alliance with the archduke of Austria, afterwards Charles V. On his return, Cardinal Wolsey wished to engage More in the service of the crown, and offered him a pension, which he refused. Nevertheless, it was not long before he accepted the place of master of the requests, was created a knight, admitted of the privy council, and in 1520 made treasurer of the exchequer. About this time he built a house on the banks of the Thames, at Chelsea, and married a second wife. This lady, by name Middleton, and a widow, was old, ill tempered, and covetous; nevertheless, Erasmus says, he was as fond of her as if she had been a young maid. More.

In the fourteenth year of Henry VIII. Sir Thomas More was made speaker of the House of Commons, and in this capacity he had the resolution to oppose the then powerful minister, Wolsey, in his demand of an oppressive subsidy; but notwithstanding this, it was not long before he became chancellor of the duchy of Lancaster, and was treated by the king with singular familiarity. The king having once dined with Sir Thomas at Chelsea, walked with him nearly an hour in the garden, with his arm round his neck. After he was gone, Mr Roper, Sir Thomas's son-in-law, observed how happy he was to be so familiarly treated by the king. To this Sir Thomas replied, "I thank our lord, son Roper, I find his grace my very good lord indeed, and believe he doth as singularly favour me as any subject within this realm; howbeit, I must tell thee, I have no cause to be proud thereof, for if my head would win him a castle in France, it would not fail to go off." From this anecdote it appears that Sir Thomas fully appreciated the king's real character.

In 1526 he was sent with Cardinal Wolsey and others on a joint embassy to France, and in 1529 accompanied Bishop Tonstal to Cambray. The king, it seems, was so well satisfied with his services on these occasions, that in the following year, when Wolsey fell into disgrace, he made him chancellor; a circumstance which seems the more extraordinary, as we are informed that Sir Thomas had repeatedly declared his disapprobation of that divorce, upon which the great Defender of the Faith was then so earnestly bent. Having executed the office of chancellor for about three years, with equal wisdom and integrity, he resigned the seals in 1533, probably to avoid the danger of a refusal to confirm the king's divorce. He now retired to his house at Chelsea, dismissed many of his servants, sent his children with their respective families to their own houses (for hitherto he had, it seems, maintained all his children, with their families, in his own house, in the true style of an ancient patriarch), and spent his time in study and devotion. But the capricious tyrant would not permit him to enjoy tranquillity. Though now reduced to a private station, and even to indigence, his opinion of the legality of the king's marriage with Anne Boleyn was deemed of so much importance, that various means were tried to procure his approbation; but all persuasion having proved ineffectual, he was, with some others, attainted of misprision of treason, for encouraging Elizabeth Barton, the nun of Kent, in her treasonable practices. His innocence in this affair appeared so clearly, however, that they were obliged to strike his name out of the bill. He was then accused of other crimes, but with the same effect; until, refusing to take the oath enjoined by the act of supremacy, he was committed to the Tower, and, after fifteen months' imprisonment, brought to trial at the bar of the King's Bench for high treason, in denying the king's supremacy. The proof rested solely on the evidence of Rich the solicitor-general, whom Sir Thomas, in his defence, sufficiently discredited; nevertheless the jury brought him in guilty, and he was condemned to suffer death as a traitor. The merciful Henry, however, indulged him with simple decollation; and he was accordingly beheaded on Tower Hill, on the 5th of July 1535. His body, which was first interred in the Tower, was begged by his daughter Margaret, and deposited in the chancel of the church at Chelsea, where a monument, with an inscription written by himself, had been erected some time before. This monument, with the inscription, is still to be seen in that church. The same daughter, Margaret, also procured his head after it had remained fourteen days upon London Bridge, and placed it in a vault belonging to the Roper family, under a chapel adjoining to St Dunstan's Church, in Canterbury. Sir Thomas More was a

More. man of great learning, and an upright judge; austere in religion, yet cheerful, and even affectedly witty.[1] Piety was a principal ingredient in his character, and he was equally devout and exemplary in all his conduct. In his hours of relaxation he had recourse to music, and had always a person to read to him whilst he sat at table, in order to prevent improper conversation before his children and servants. He lived in habits of intimacy with the most learned men of his time, particularly Erasmus, who held the first place in his affections, and deserved his esteem; nor was he less respected and admired abroad. When the Emperor Charles V. heard of his death, he said to the English ambassador, Sir Thomas Elliot, "I understand that the king, your master, has put to death his faithful servant and wise counsellor Sir Thomas More." The ambassador answered that he had heard nothing of the matter. "It is too true," replied the emperor; "and this I will say, that if I had been master of such a servant, of whose abilities I have, these many years, had no little experience, I would rather have lost the best city in my dominions than so worthy a counsellor." It is even said that the ruthless tyrant, who had pursued him with inflexible perseverance to the scaffold, felt some compunctious visitings of remorse when the thirst of vengeance had ceased to operate; and, upon receiving the news of his execution, observed to Anne Boleyn, "Thou art the cause of this man's death;" after which he hastily withdrew, and shut himself up in an adjoining chamber.

Sir Thomas More was the author of various works, both in English and in Latin, of which the best known and most generally esteemed is his *Utopia*. His English works were collected and published by order of Queen Mary in 1557; his Latin works appeared at Basil in 1563, and at Louvain in 1566; and both show that he was thoroughly conversant with every branch of polite learning. For a minute account of his works, the reader is referred to Oldys's *Librarian*, and preface to Dibdin's edition of the *Utopia*. The best, because the most discriminating and judicious character of More, is that drawn by Sir James Mackintosh in his *History of England* (vol. ii. p. 177, et seq.), to which the reader is referred. "He was the first Englishman who signalised himself as an orator, the first writer of prose which is still intelligible, and probably the first layman since the beginning of authentic history who was chancellor of England, a magistracy which has been filled by as many memorable men as any office of a civilized community."

This excellent person left one son and three daughters; of whom Margaret, the eldest, was remarkable for her knowledge of the Greek and Latin languages. She married Mr Roper of Wellhall, in Kent, whose life of Sir Thomas More was published by Mr Hearne at Oxford in 1716. Mrs Roper died in 1544, and was buried in the vault of St Dunstan's in Canterbury, with her father's head in her arms.

More, *Hannah*. a distinguished writer of religious and moral works, was born at Stapleton, in Gloucestershire, in the year 1745. Her father held the humble situation of village schoolmaster; but his sobriety and diligence were such as to secure for him an appointment to the parochial school of St Mary Redcliff, at Bristol. Here his daughter gained the intimacy and patronage of Dr Stonehouse, and opened an establishment for boarders, having previously, through the same interest, been enabled to set on foot a flourishing and respectable day-school. Her first literary efforts were some poetical pieces, written for the edification of her pupils, and amongst them was a pastoral drama. Manuscript copies of these pieces were seen and admired by several persons of literary taste and discrimination at Bristol, who strongly recommended their publication. They accordingly appeared, and the drama, which was entitled the Search after Happiness, soon became very popular. This flattering reception having induced the author to try her strength in the highest walk of dramatic poetry, she successively brought upon the stage her tragedies of the Inflexible Captive, Percy, and the Fatal Falsehood, which closed her dramatic career. Mr Garrick was warmly attached to her, and, by the exertion of his wonderful histrionic powers in the second of these compositions, it was enacted at Drury Lane during fourteen successive nights; but none of her dramas now retain any hold of the stage. Soon after the production of her first tragedy, she published two legendary poems, entitled Sir Eldred of the Bower, and the Bleeding Rock, founded upon popular traditions current in Somersetshire. These pieces had very great success, as had also her volume of Essays for Young Ladies, which she afterwards expunged from the edition of her works published in 1801, on the ground that the book was superseded by her Treatise on Female Education.

In 1782, Hannah More greatly added to her reputation by the publication of a volume of Sacred Dramas, to which was annexed a poem called Sensibility, which was much commended by Dr Johnson, then the autocrat of literature. Being asked his opinion of the author on one occasion, he replied, "I know and esteem her well, Sir; and I think her the best of all our female versifiers." In 1786, this indefatigable writer gave to the world two poems, Florio, a tale, and Bas Bleu, or the Conversation. The first is a respectable and not ill-natured satire on the frivolous manners of the young gentlemen of the period. The second is also a satire on the Blue Stocking Club, which met at Mrs Montagu's, in Portman Square, and was so called from one of the members always wearing that article of dress. Other works successively proceeded from her pen. Of these the principal are, a Poem on the Slave Trade, printed in 1788; a tract entitled Thoughts on the Manners of the Great, which appeared the same year; an Estimate of the Religion of the Fashionable World, published in the year 1791, and esteemed one of her best productions; Remarks on the Speech of M. Dupont, in the National Convention, on Religion and Education (the speaker had openly avowed atheism in that assembly); and further, with the view of opposing the propagation of sedition and infidelity, she, in 1795, commenced at Bath, the Cheap Repository, which was published in monthly numbers, and contained several very pleasingly written tales. This periodical obtained a very wide circulation, and was said to have had considerable effect in calming the public mind, then agitated by the doctrines so prevalent in France.

Mrs More now removed from Bristol to Cheddar, where objects of misery having deeply affected her sympathetic and religious feelings, she opened a number of schools for educating the poor children, and alleviating their misery. Her benevolent designs were at first strenuously opposed; but she ultimately succeeded in establishing a number of schools, not only at Cheddar, but all round the Mendip Hills; and the good effects which they produced soon became apparent. In 1799 appeared her Strictures on the Modern System of Female Education, three editions

[1] This last disposition, we are told, he could not restrain even at his execution. The day being come, he ascended the scaffold, which seemed so weak that it was ready to fall to pieces; whereupon he said, "I pray, see me safe up; and for my coming down, let me shift for myself." His prayers being ended, he turned to the executioner, and with a cheerful countenance said, "Pluck up thy spirits, man, and be not afraid to do thy office; my neck is very short, take heed therefore thou strike not awry for saving thy honesty." Then laying his head upon the block, he bade him stay until he had put aside his beard, saying that it had never committed any treason.

Morea ‖ Moreau.

of which issued from the press in the same year. This work was censured by some of the critics as too austere; but notwithstanding this circumstance, she was called upon by the highest personages in the realm to put her sentiments in writing on the proper course of instruction to be adopted for the infant heiress to the British throne. She set diligently to work to obey the royal commands, and produced, in 1805, a work in two volumes, under the unassuming title of Hints towards forming the Character of a Young Princess. It gave high satisfaction generally; but offence was taken in one quarter, and much abuse was in consequence poured upon it. In the year 1809 was published Cœlebs in Search of a Wife; two years afterwards appeared Practical Piety, and Christian Morals; in 1815 came out an Essay on the Character and Writings of St Paul; and, soon after her sister Martha's death in 1819, the literary career of Mrs More terminated with the publication of Modern Sketches. She was now aged and infirm, but still continued to take a great interest in the welfare of charity schools, bible and missionary societies, and other benevolent and religious institutions. Her piety supported her in her later afflictions, and she expired with the composure, and full of the hope and faith, of a Christian, on the 7th of September 1833. She is said to have realised L.30,000 by her works, a very considerable proportion of which she bequeathed to religious and benevolent societies.

The works of Hannah More have always been highly esteemed by the religious world, and she is generally considered as one of the most distinguished of that class of writers who unite great piety with considerable literary talent, and dedicate the creations of fancy as well as the deductions of reason to the service of religion. Her poetry is not much prized, except by a select few, for the piety and sound judgment which it displays. In this respect it bears a general resemblance to the verse of Cowper; but it is not very copiously embued with that fine ethereal spirit, which alone can give vitality and soul to the inspirations of the muse. Her prose is justly admired for its sententious wisdom, its practical good sense, its masculine vigour, and the dignified religious and moral fervour which pervades it. Cœlebs passed through six editions in one year; and since its first appearance it has frequently been reprinted, besides being translated into several foreign languages. (R. R. R.)

MOREA, late a province of the Turkish empire, now a part of the state of Greece. It extends in north latitude from 36. 23. 20. to 38. 26. 4. and in east longitude from 21. 5. to 23. 29., being 7920 square miles.

MOREAU, John Victor, one of the greatest generals of the French revolution, was born at Morlaix, in the year 1763. He was the son of a respectable advocate, who had destined him for the same profession; but having early conceived a decided predilection for the army, he enlisted in a regiment, in which he served for a short time, until his father purchased his discharge, and sent him to resume his studies. He did so with considerable success, and at length became *prévôt de droit* at Rennes, where he exercised a sort of supremacy over the students, by whom he was greatly beloved. In 1787, when the ministry wished to effect a revolution in the magistracy, he joined in resisting the attempt, and having figured in the early troubles, as chief of the youth of Rennes, was called "the general of the parliament." At the commencement of the revolution, he raised a company of volunteer gunners, of which he became captain, and having organized and instructed it, he continued to serve in the same capacity until the year 1792. Far from foreseeing the part which he was destined one day to perform, he became tired of a situation which seemed to lead to nothing, and took measures to get admitted into the gendarmerie, where he aspired only to a subaltern rank. But, happily, his wishes were not complied with, and he enrolled himself in a battalion of volunteers which was then setting out to join the army of the North. Moreau.

He made his first campaign under Dumouriez, as commandant of a battalion; in 1793, he became general of brigade, and the following year he was promoted to the rank of general of division, on the recommendation of Pichegru, who immediately confided to him a corps destined to act in maritime Flanders. Moreau took possession first of Menin, then of Bruges, Ostend, Nieuport, the island of Cassandria, and, lastly, of Sluys, which capitulated on the 26th of August. At the moment when he made this conquest for the republic, the revolutionists of Brest were sending his aged father to the scaffold as an aristocrat. This venerable old man, whom the people of Morlaix called the father of the poor, had undertaken to manage the property of some emigrants; and this was employed as a pretext to destroy him. Moreau had already become disgusted with the revolutionary system, and such an event naturally increased his detestation. He conceived that he had no longer any country but the camp, nor any home but his tent in the field.

From this time, however, he began to lay the foundation of his military reputation, and commanded, with great distinction, the right wing of the army of Pichegru, which, during the celebrated winter campaign of 1794, subjugated Holland to France. Supported by the suffrages and friendship of his general-in-chief, and esteemed by all for his talents and bravery, he was appointed to the command of the army of the North, when Pichegru went to assume that of the army of the Rhine and Moselle; and immediately devised a plan of operations worthy of a consummate general, which he communicated to the revolutionary government established in Holland, and peremptorily required them to sanction. After the retreat of Pichegru, he assumed the chief command of the army of the Rhine and Moselle, and, in the year 1796, opened that campaign which became the foundation of his military fame. Having driven back Wurmser towards Manheim, he effected the passage of the Rhine near Strasburg, attacked the Archduke Charles at Rastadt, forced him to abandon the course of the Necker, and, on the 11th of August, fought a battle near Heydenheim, which lasted seventeen hours. The Austrians having retired on the Danube, Moreau advanced, and soon found himself opposed by General Latour, who was daily receiving reinforcements; but believing himself supported by the diversion, or rather the parallel invasion, of Jourdan towards Ratisbon, he continued his forward movement. The discomfiture and retreat of Jourdan, however, disconcerted all his combinations, and, leaving his flank completely uncovered, obliged him to retire. This retreat commenced on the 11th of September, and, though severely criticised by Napoleon, is unquestionably one of the finest operations of the kind recorded in the history of war. At first he appeared desirous to occupy both banks of the Danube; then suddenly repassing the Lech, he defeated, one after another, in his retrograde march, all the enemy's corps which sought to intercept his retreat. In spite of the greatest obstacles, he succeeded in debouching into the Brisgau, passed the Rhine at Brisach, and preserved on the right bank two bridge-heads, one at Brisach, and the other at the fort of Kehl. This fine retreat from the frontiers of Austria and Bavaria to the banks of the Rhine was generally and justly admired. Though pressed by superior forces, with both his flanks uncovered, he showed a religious respect for the neutrality of Switzerland, and preferred forcing a passage through the defiles of the Black Forest, already occupied by the imperialists, to the violation of a neutral and friendly territory; an example but rarely imitated. Nor was this all. With a noble su- Moreau.

Moreau. periority to all feelings of rivalry, Moreau, having learned that Bonaparte found himself hard pressed by the Austrian forces in Italy, detached a corps sufficient to reinforce him, and received, in return for this seasonable aid, the warmest acknowledgments from Carnot, then at the head of the war department.

At the opening of the next campaign, 1797, Moreau, resuming the offensive, effected the passage of the Rhine, in open day, by main force, and in the face of the enemy ranged in order of battle upon the opposite bank. This brilliant operation took place on the same day that the preliminaries of Leoben were signed by Bonaparte, and the immediate consequences were the surrender of the fort of Kehl, and the capture of nearly forty thousand prisoners, besides several standards. The army passed the rest of the summer in its positions.

The republic was then on the verge of a crisis, brought on by the struggle which had taken place between the executive directory and the councils, that is, between the revolutionary principle and the commencement of monarchical ideas. But it was not until after the 18th of Fructidor (4th of September 1797) that Moreau, challenged by the directors, whom force had rendered triumphant, gave up to them the correspondence of the Prince of Condé with Pichegru, which had been seized at the commencement of the campaign, in the baggage-waggons of an Austrian general, and which he had hitherto kept back, partly from regard to his old friend and benefactor, partly from a desire to await the issue of the struggle between the government and the councils. Being almost at the same moment ordered to Paris, by that portion of the directory which had proved victorious, and to which he had been denounced, Moreau, on the 7th of September, transmitted to that body a copy of one of his proclamations, the effect of which, he said, had been to convert many persons favourable to Pichegru, " for whom he had long lost all esteem and respect." This letter, which was then strongly condemned by the public, as an act of excessive weakness, did not, however, appear in the same light to Pichegru himself, by whom it was regarded with indifference; and it is certain that his friendship for Moreau suffered no diminution in consequence. But, however this may be, it did not conciliate in favour of the writer the good will of a suspicious government, and Moreau was even obliged to resign, and to shelter himself in retirement.

He remained unemployed until towards the end of the year 1798, when he received the title of inspector-general, which was a mere nominal appointment; but in the month of April 1799, the misfortunes which had attended the recommencement of war rendered his talents necessary. Of all the French conquests, that of Italy appeared to be in the greatest danger. Moreau was therefore sent to the army commanded by Schérer, on the Adige, where he remained several months without command, and witnessed defeats which his counsels could neither prevent nor repair. Schérer, however, finding all his resources exhausted, devolved on him the task of saving the army. Moreau had already, in a council of war, signified his opinion, that the army should retire on Piedmont, avoiding any serious engagement with the Austro-Russian army, which had already acquired a decided superiority, and was now rapidly advancing under Marshal Suwarof. At length, after long resisting the entreaties of the other generals, he accepted the command of the army, when it had retired behind the Adda. Being soon forced from his position at Casano, he retired in good order on the Tesino; and having carried his right towards the Apennines, he formed a sort of intrenched camp behind the Po and the Tanaro, between Alessandria and Valentia. On the 11th of May he repulsed the Russians near Bassignano, and then passed the Bormida; but being assailed by the greater part of the forces under Suwarof, he was obliged to evacuate Valentia and Alessandria. The war had now assumed a counter-revolutionary character, and every advance of the allies was favoured by insurrections of the peasants, who joined them on all sides. In this critical situation Moreau retired upon Coni, and took up a position on the Col di Tende, causing the division of General Victor to defile by his right, in order to maintain his communications with General Macdonald, who was then rapidly advancing from the kingdom of Naples in order to join him. In the view of seconding this operation, Moreau penetrated into the country of Genoa by the Apennines, the passages and heights of which he occupied; and he hoped immediately to resume the offensive. But in vain did he quit Genoa with fifteen thousand men, and beat the corps with which the Austrian general Bellegarde attempted to oppose him; in vain did he relieve Tortona, and drive the enemy as far as the Voghera: the victory which Suwarof gained over the army of Naples at the Trebbia rendered all his efforts unavailing, and forced him to regain the shelter of the Apennines. Moreau.

Moreau had just been appointed to the chief command of the army of the Rhine, when Joubert arrived to replace him in that of Italy. Being on the point of fighting a battle,—which, by the fall of Mantua, and the junction of Kray with Suwarof, had become inevitable,—Joubert wished to leave the direction of it to him; but he refused, and begged permission to combat under the orders of the new chief of the army. At this battle, which was fought at Novi, and in which Joubert fell, Moreau run the greatest risks, having had three horses killed under him, and his uniform pierced by balls. After a fierce conflict, the French army was defeated; but Moreau operated his retreat with so much superiority, that he almost nullified the victory which the allies had gained.

In proceeding to assume the command of the army of the Rhine, Moreau reached Paris at the moment when the Directory was sinking under the weight of contempt, hatred, and its own imbecility. The faction which had formed the design of overturning it, persuaded that nothing but the adhesion of a general of great reputation could restore consideration to the government, sounded Moreau, who, distrusting his ability to direct the affairs of his country amidst the conflict of parties, refused to attempt such a task. It is known that he afterwards regretted bitterly this distrust in himself.

On the arrival of Bonaparte, who had escaped from Egypt, Moreau consented to serve under the orders of that general, and, by his influence and means, to promote the revolution which was then preparing. But scarcely had it been effected at Saint-Cloud, on the 18th of Brumaire (9th of November 1799), when he saw reason to apprehend that he had concurred in giving a tyrant to his country. Being almost immediately called to assume the command on the Rhine and the Danube, he introduced several important changes into the constitution of the army. He began by placing the corps of the wings and centre under the orders of three lieutenants upon whom he could implicitly depend. He then formed a corps of reserve, amounting to nearly one third of his whole force, and destined to act only under his own orders. His plan, which consisted in penetrating into Suabia, and even into the heart of the hereditary states, was not approved by Bonaparte, who, thinking only of reconquering Italy, wished to make the army of the Rhine merely an army of observation. But Moreau stuck firmly to his plan, and resisted. Napoleon felt greatly offended; and this dispute as to the co-operation of the two armies proved the germ of that mutual hatred which sprung up between these celebrated rivals, and which was probably one of the causes of their common ruin. Nevertheless, as the prompt success of the operations on the Rhine could alone open to Bonaparte a passage into Italy, by drawing off the

Moreau. Austrians from those positions where they might have intercepted his communications with France, it became necessary to yield, and to leave to Moreau all the honour of the conception of the plan of campaign, and all the means for carrying it into execution. Accordingly a sort of arrangement took place at Paris, where General Dessoles, head of the staff of the army of the Rhine, discussed the subject with Napoleon, and ultimately succeeded in inducing him to give way to the opinion of Moreau.

The success of the campaign which ensued was throughout decisive. At its commencement Moreau, having led Field-marshal Kray, who was opposed to him, to entangle himself in the valleys descending from the Brisgau, effected the passage of the Rhine at Stein. He encountered the enemy, first at Stockach, where he defeated him, and then fought successively the battles of Engen and Moeskirch, in both of which he was victorious. Kray, forced to abandon his line of operations, had retired in good order beyond the Danube. Moreau immediately marched into Suabia, upon which the imperial army repassed the river; but being overtaken by the French, it was once more defeated at Biberach. The Austrians then retired into their intrenched camp at Ulm, and being thus separated from the Tyrol, could undertake nothing calculated to change the course of events, or obstruct Napoleon in effecting the passage of the Great St Bernard. In this way the victories gained by Moreau facilitated the conquest of Italy; and he even detached a corps of twelve thousand men to reinforce the army of the First Consul. Finding, however, that neither his demonstrations, nor his rapid incursions into Bavaria, could induce Marshal Kray to quit his unexpugnable position at Ulm, Moreau conceived the design of crossing the Danube below that place, and throwing himself between the Austrian army and its magazines, that is, upon its line of communications. To pass the river above Donawerth, to force the enemy's army to quit its intrenched camp by detaching it from its base of operations, and to oblige it to retreat, leaving Bavaria uncovered; such was the bold plan, the complete execution of which crowned the talents of the general by whom it had been devised. Having advanced beyond the Lech, Moreau attacked the Austrians along their whole line, crossed the Danube at Blenheim by main force, and, on the left bank of the river, in the plains of Hochstädt, obtained, by similar manœuvres, on the 19th of June, an advantage similar to that which Bonaparte had gained at Marengo only three days before. Kray having at length abandoned his position at Ulm, Moreau marched in pursuit of the marshal, whom he once more vanquished at Neuburg; he then entered Bavaria, again defeated the Austrians at Landshut, and only suspended his operations after having caused them to sign, on the 15th of July, the armistice of Parsdorf, in imitation of the convention entered into at Alessandria.

This suspension of arms continued until the end of November, when Moreau, having returned to his army, announced to it the resumption of hostilities. His adversary was now the Archduke John, and the army opposed to him amounted to an hundred and twenty thousand men. This numerical superiority of force inspired the Austrians with such confidence that they assumed the offensive. The two armies were then separated by the course of the Inn. The archduke passed the river, and the left wing of the French, being opposed to the mass of his army, Moreau retreated, and continuing his movement on Hohenlinden, succeeded in drawing the enemy into the defiles near that place. The moment for striking a blow had now arrived. At this place, on the 3d of December 1800, he delivered to the Austrian army that bloody and decisive battle, in which there was not a French corps that did not come into action and cover itself with glory. The contest began in the centre, and soon became general; but all the efforts of the Austrians to debouch from the forest into the plain proved unavailing. The corps of General Richepanse, marching across the forest, turned the Austrian centre, which it soon put to flight; and this was followed by that of the remainder of their army. Thus terminated this memorable battle, which was completely gained by the literal and precise execution of the plan prescribed by the general-in-chief, particularly in regard to the flank movement of Richepanse on the enemy's line of retreat, which decided the fortune of the day. At four o'clock, eleven thousand prisoners and a hundred pieces of cannon were in the hands of the victors; and these trophies would have been still more considerable had not the long winter night and the bad state of the roads favoured the retreat of so many broken and disunited corps. More than six thousand Austrians remained on the field of battle, whilst the loss of the French did not exceed two thousand five hundred men killed and wounded. To the congratulations of his generals, Moreau replied by attributing to them the principal share in the glory of the day; and the only indication of joy which escaped him was betrayed by the observation he made to them: "My friends, you have conquered peace." Moreau.

The archduke having taken refuge behind the Inn, Moreau pursued him without intermission, gained another victory at Lauffen, and having passed the Salza, occupied Saltzburg, penetrated into the hereditary states, and, continuing his advance, carried terror to the gates of Vienna. Nor did he suspend his march until the Archduke Charles, who had been again placed at the head of the imperial army, announced to him that the emperor had resolved to make peace, whatever might be the determination of his allies; and this declaration served as the basis of the armistice of Steyer, signed on the 25th of December. This campaign of twenty-five days placed Moreau in the rank of the greatest captains, and entitled him to the homage of public admiration, which was paid to him on his return to Paris.

Bonaparte presented him with a pair of pistols magnificently mounted, observing that he had wished to have had his victories engraved on them, but found that there would not be room; a forced eulogium, which betrayed the ill-dissembled jealousy excited by so many triumphs. Napoleon knew that Moreau had been indebted for his victories to the rare devotion of the secondary generals, and the good spirit of the army, which he had captivated by his natural benevolence; he was not ignorant that Moreau commanded with firmness, but never with harshness, preserving always towards his principal officers the affectionate tone of a comrade; and that his head-quarters resembled a family circle, where all objects of public interest connected with war and administration were discussed with the most perfect freedom.

This last consideration had given great umbrage to Bonaparte; and Moreau, who was deficient in civil prudence, acted in such a manner as to increase the suspicion with which he was regarded. His house became the rendezvous of persons avowedly inimical to the consular government; and he was by imperceptible degrees drawn into that fatal connection with Pichegru and his associates which eventually proved the cause of his ruin. The particulars of this affair, with the arrest, imprisonment, trial, and sentence of Moreau, will be found narrated in the historical portion of the article FRANCE, to which the reader is accordingly referred. On the 10th of June 1804, he was sentenced to two years' detention, which, by the influence of Fouché, was commuted into permission to travel, on condition that he should retire to the United States, and not return to France without the leave of Bonaparte. He accordingly set out for Spain, escorted by gendarmes, and in 1805 embarked at Cadiz for the United States, where he resided for about eight years, beloved and respected by all who knew him.

Morebat || Morel.

After the disasters which befel the French grand army in the retreat from Moscow, and when Napoleon, with incredible energy, was repairing his losses, and about to renew the contest in Germany, the Emperor Alexander, aware that he had no general capable of contending with that wonderful man, made secret overtures to Moreau; and the latter having decided to embrace the offers of the Czar, and join him in the approaching contest, embarked on the 21st of June 1813 with M. de Svinine, counsellor of the Russian embassy, and on the 24th of July entered the port of Gottenburg. At Stralsund he passed three days with his old companion in arms Bernadotte, then Crown Prince of Sweden, and having concerted with him the plan of the ensuing campaign, proceeded to join the allied sovereigns at Prague, where, as might have been expected, he was received in the most flattering manner.

The plan of the allies consisted in debouching from Bohemia with their grand army, in order to turn and attack Dresden, which formed the pivot of Napoleon's operations. The attack commenced on the 26th of August, and was resumed the following day, when Moreau, having advanced to observe a movement of the French, was struck by a cannon ball, which fractured the knee of the right leg, and, passing through, carried away the calf of the left. He fell into the arms of Colonel Rapatel, exclaiming, "I am done for, but it is pleasant to die in so good a cause." Being removed to an adjoining house, he there underwent amputation of the right leg, and the same operation was performed on the left, which had been too much shattered to admit the possibility of its being saved. In this horribly mutilated condition, the allied army being now in full retreat, he was transported to a considerable distance on a blanket covered with curtains, and the following day carried as far as Laun, where he lingered in agony till the morning of the 2d of September, when he expired. At the time of his death he had prepared for publication a proclamation to the French, which the Emperor Alexander had approved, and in which he explained the object of his return to Europe, the most questionable act of his life; namely, to assist the French in emancipating themselves from the despotism of Bonaparte, and to sacrifice his life, if necessary, to restore prosperity to his country, all the true sons of which he invited to rally round the standards of independence. It is unfortunate for his memory, however, that he died in arms against his country; that his personal wrongs obliterated all sense of the duty which he owed her as a son, whoever might be at the head of her government; and that, having joined the enemies of her glory, he fell in the moment when the arms of France were victorious. As a warrior, however, Moreau was superior to all the generals of the Revolution, Napoleon excepted; he combined the caution of Fabius with the cool determination of Turenne; in every succeeding campaign his genius shone forth with increased splendour; and his last achievement at Hohenlinden exhibited an union of scientific combination with precise and vigorous execution which has seldom been equalled and never surpassed. (A.)

MOREBAT, a sea-port of Arabia, situated on the southern coast, on a bay bounded by a cape of the same name. It is a poor place; and the inhabitants carry on little trade either by sea or land with the interior. The town is about two miles south of the Cape. Long. 55. 4. E. Lat. 17. N.

MOREL, WILLIAM, a learned printer, was born in the year 1505, at Tilleul, a town of the county of Mortain, in Normandy. Though the son of poor parents, he nevertheless found means to procure education; made rapid progress in the study of the ancient languages; and having gone to Paris, gave lessons in Greek to some young persons, and then became corrector of the press to Jean Loys, better known under the name of Tilletan. In 1544, he published a commentary on Cicero's treatise *De Finibus*, which he dedicated to Spifame, chancellor of the university; in 1548, he assisted Bogard in an edition of Quintilian's *Institutions*, to which he added notes; the following year he was admitted into the corporation of printers at Paris, and established, near the college of Reims, a printing-house, whence issued several editions of Greek works, esteemed for their correctness; and, in 1552, he was associated with Turnebus as printer of Greek to the king, and appointed his successor in the direction of the royal printing establishment. After this he published several good editions, enriched with notes and various readings derived from the best manuscripts; but he was ill recompensed for his zeal, and died on the 19th of February 1564, leaving his family in absolute want. Besides the commentaries on Cicero's treatise, already mentioned, he published, 1. Notes on the works of Dionysius the Areopagite, Cyprian, Demosthenes, &c. an explanation of the most difficult passages in the oratorical works of Cicero, and a supplement to the Chronicle of Carion; 2. Latin translations of the Opinions of the Fathers on the respect due to Images, the Epistles of Ignatius, and other works; 3. De Græcorum Verborum Anomaliis Commentarius, Paris, 1549, and Lyons, 1560, in 8vo; 4. Commentarius Verborum Latinorum cum Græcis, Gallicisque conjunctorum, Paris, 1558, in 8vo, reprinted under the title of *Thesaurus Vocum Omnium Latinarum, ordine alphabetico digestarum;* 5. Tabula Compendiosa de Origine, Successione, &c. Veterum Philosophorum, Paris, 1578, in 4to. (A.)

Morel.

MOREL, *Frederick*, the elder, was descended of a family of distinction in Champagne, where he was born in the year 1523. He went to Paris to study the ancient languages, in which he made remarkable progress. In 1552, he undertook to revise the manuscript of Toussain's Greek Lexicon, the first edition of which was published the same year; and in 1559, he established a printing-house in the Rue Saint-Jean de Beauvais. His erudition was already so considerable, that the most distinguished writers eagerly intrusted him with the publication of their works. In 1571, he was appointed first printer in ordinary to the king. This title, however, he but rarely assumed, and only at the end of books which had issued from his own press. In 1581, he obtained the reversion of the office for his son, and died on the 17th of July 1583. Besides some small pieces in Greek and Latin inserted by Mattaire in the Life of this printer, he wrote, 1. Three Treatises of St Chrysostom, translated in French, 1557, in 16to; 2. Discours du Vray Amour de Dieu, 1557; 3. De la guerre continuelle, et perpetuel combat des Chrétiens contre leurs plus grands et principaux ennemis, 1564, in 8vo; 4. Douze Manières d'Abus, extracted from the works of St Cyprian. (A.)

MOREL, *Frederick*, the younger, one of the most learned Hellenists of his age, was born at Paris in 1558, and, after completing his classical studies, sent to Bourges to attend the prelections of the celebrated Cujas. Having compared with the text the version which Amyot had just published of part of the works of Plutarch, he found that the translator had not always rendered faithfully the sense of the original, and ventured to intimate this to himself. Amyot, far from taking amiss the boldness of the youth, received his communication kindly, and ever afterwards took a deep interest in his success. Young Morel succeeded his father as printer to the king in the year 1581, but it was not until 1583 that his name appeared in the imprint of the works which issued from this press. The editions he published were remarkable for their beauty and correctness; and he commonly enriched them with interesting prefaces and notes. Having married the daughter of Leger Duchesne, professor of eloquence in the Royal College, he obtained, through the influence of Amyot. the chair of his

Morell. father-in-law, which the advanced age of the latter obliged him to resign in the year 1585. But the duties of this office did not abridge his typographical labours; for he suffered not a year to elapse without publishing some new editions of Greek authors, with learned commentaries or translations, the merit of which is still recognised. In 1600, he took into partnership with him his brother, Claude Morel, to whom he committed the direction of the printing establishment; and applied with more ardour than ever to the collation of manuscripts, and the verbal criticism of the ancient authors. Nor did the zeal which he evinced for the advancement of letters remain without recompense. Henry IV. augmented his salary as professor, and made him several grants to facilitate the impression of works, the sale of which was not likely to be proportional to their utility. In 1617, Morel renounced the exercise of his art, at least no work of a posterior date with his name affixed to it has yet been discovered; in 1619, he published a new edition of the Plutarch of Amyot, with numerous corrections, and a curious advertisement which Mattaire has inserted in his *Vitæ Typographorum Parisiensium* (p. 135); and he died on the 27th of June 1630, being at the time of his decease deacon of the royal printers and professors. Besides the numerous editions which he published with prefaces, advertisements, and corrections, he was the author of, 1. Notes on Strabo, Catullus, Tibullus, Propertius, the *Sylvæ* of Statius, Dion-Chrysostom, Œcumenius, &c.; 2. Translations into Greek verse of several Hymns and Epigrams selected from Martial; 3. Various translations into Latin prose and verse; 4. *Alexander Severus, Tragœdia togata*, 1600, in 8vo. (A.)

MORELL, Andrew, an eminent antiquary, was born at Berne, in Switzerland, on the 9th of June 1646. He had a strong passion for medals, in the knowledge of which he equalled, if not surpassed, all his contemporaries; and in the course of his travels, which were extensive, he made large collections of them. His rapid progress in history developed his taste for numismatics, which he regarded as one of the principal foundations of historical knowledge; and this taste was improved by his acquaintance with Charles Patin, author of a work on the subject, whom he had accidentally met at Bâle, and whose friendship he ever afterwards retained. In 1680, Morell went to Paris, where his reputation procured him admission into the society of the learned, and where, in 1683, he published *Specimen Universæ Rei Nummariæ Antiquæ*, a second edition of which, corrected and enlarged, appeared at Leipzig in 1695. Soon after the publication of this essay, which was intended as a specimen of a greater work, embracing a complete collection and description of ancient medals, he was associated with Rainssant in the keepership of the royal cabinet of medals, and applied with indefatigable ardour to the classification and arrangement of the rich materials it contained. When he had completed this laborious task, the promised recompense was from some cause deferred; and having complained of the delay in a manner which displeased Louvois, he was by order of that minister committed to the Bastille, where he was confined for more than three years. By the intercession of the government of Berne, he was liberated on the 16th of November 1691, and returned to his native city, where he resumed the prosecution of his great work, but made little progress, being unable to defray the heavy expense necessary for the execution of his design. In 1694 he went to Germany, upon an invitation from the Count de Schwartzenburg-Arnstadt, who had a fine collection of medals, with the charge of which he intrusted Morell, at the same time furnishing him with the means of carrying on his great work. But he did not long enjoy the comfort and tranquillity which he found in the castle of Arnstadt. A fall from a carriage, in which he dislocated his shoulder, and a consequent attack of paralysis, obliged him to suspend his labours, and he died on the 11th of April 1703, lamenting that he had not been able to complete the work upon which he had so long been engaged. Havercamp having collected and arranged his scattered materials, published, in 1734, *Thesaurus Morellianus, sive Familiarum Romanarum Numismata Omnia*, in two vols. folio, of which one consisted of plates and the other of text. Morell having also left in manuscript the numismatical history of the first twelve Roman emperors, Havercamp, Schlegel, and Gori, undertook to publish it with ample commentaries; and the work appeared in 1752, under the title of *Thesauri Morelliani Numismata Aurea, Argentea, Ærea, cujusque moduli* xii. *priorum Imperatorum*, Amsterdam, in three vols. folio, with figures. Morell also published several letters, particularly one in Latin addressed to Perezonius *De Nummis Consularibus*, which appeared in 1701, in 4to. (A.)

Morell ‖ Morelli.

Morell, *Thomas*, well known as a classical scholar and editor, was born at Eton, in Buckinghamshire, on the 18th of March 1703. At the age of twelve, he was admitted on the foundation at Eton School, and thence elected in 1722 to King's College, Cambridge, where he successively took his degrees in arts and theology. In 1731, he was appointed curate of Kew, and for some time officiated in the same capacity at Twickenham; in 1737, he was, on the presentation of his college, instituted rector of Buckland; and in 1775, we find him acting as chaplain to the garrison at Portsmouth. He died on the 19th of February 1784, after having devoted his long life to the discharge of his ecclesiastical duties, and the cultivation of the ancient languages, diffusing at once the love of religion, and a taste for classical literature. His principal works are, 1. A Collection of Theological Poems, original, and translated from the Latin of Vida, with notes, London, 1732–36, in 8vo; 2. An edition of Chaucer's Canterbury Tales, with modern imitations, London, 1737; 3. An edition of the works of Spencer, 1747; 4. The Hecuba, Orestes, Phœnissæ, and Alcestes of Euripides, with ancient scholia and notes, London, 1748; 5. An English translation of the Hecuba, with annotations; 6. The Prometheus of Æschylus, with scholia, notes, and an English translation in blank verse, 1767; 7. Two Letters on Greek inscriptions found upon an altar at Corbridge in Northumberland; 8. Editions of the Greek Lexicon of Hederick, and of the Latin Dictionary of Ainsworth; 9. Thesaurus Græcæ Poëseos, sive Lexicon Græcc-Prosodiacum, Eton, 1762, in 4to, an imitation of the *Gradus ad Parnassum*, since considerably augmented and enlarged by Dr Maltby, Cambridge, 1815; 10. Various other works, particularly a catalogue of Mr Child's library, in 4to, and Annotations on Locke's Essay, 1793, 8vo. (A.)

MORELLI, James, the celebrated librarian of St Mark, at Venice, was born in that city on the 14th of April 1745. His father, a native of Lugano, exercised the employment of proto-muratore. Morelli received the rudiments of his education under a priest named Testa, but it was in a convent of Dominicans that he acquired a taste for solid studies, and laid the foundation of his future eminence. Having assumed the clerical habit, he was in due time admitted into the priesthood, the duties of which, however, did not prevent him from devoting a considerable portion of his time to literary pursuits; and at length he became an able critic, a learned antiquary, and rendered himself familiar with the history of nations as well as that of the sciences and arts. But the subject which chiefly interested him was that of bibliography, in which he was destined to attain to great eminence and distinction. In 1774, he printed his *Dissertazione Storica della publica Libreria di S. Marco.* In 1785, he published his Latin version of the oration of Aristides against Leptines, the Declamation of Libanius for Socrates, and fragments of the second book of the Harmonic Elements of Aristoxenes, all from Greek manuscripts. But one of his most important publications is

Moreri.

that of the Fragments of Dion Cassius on Roman History, with new readings, which appeared in 1798, and was followed by a great variety of other publications and editions. In 1802, the Emperor Francis conferred on him the title of aulic counsellor; in 1816, he received the decoration of a knight of the iron crown; and in the beginning of May 1819, he died, at the advanced age of seventy-four. A complete list of Morelli's numerous publications, sixty-two in all, is annexed to the account of his life in the *Biographie Universelle*, to which the reader is referred, as, from their peculiar nature, any selection would not serve to give an idea of their general character. They are chiefly bibliographical, intermixed with editions of various works, some of which have already been noticed. (A.)

MORERI, Louis, author of the Historical Dictionary which bears his name, was born at Bargemont, in Provence, on the 25th of March 1643. Being destined for holy orders, he received the elements of his education at Draguignan and at Aix, and afterwards went to study theology at Lyons, where he acquired a knowledge of the Italian and Spanish languages, which afterwards proved of great use to him in his biographical labours. His early productions gave but faint indications of his future eminence. At the age of eighteen he composed the *Pays d'Amour*, a frigid allegory, and, under the title of the *Doux Plaisir de la Poésie*, made a collection of pieces in verse; but the former evinced no peculiar aptitude for the ecclesiastical state, and the latter gave little promise of such a work as the Historical Dictionary. During his residence at Lyons he took priest's orders, and preached controversy. But the idea which had long occupied his mind, and to the development of which he devoted his life, was the composition of his Dictionary, which appeared at Lyons in 1673, in one volume folio, when he was only thirty years of age. The immense erudition displayed in this work excited general admiration; but, as might have been expected, it was nevertheless found to be very incomplete. The author, however, applied himself with great vigour to enlarge it; and the second edition, in two vols. folio, was printed at Paris in 1681, the year after the author's death. The third edition, which appeared in 1683, is merely a reprint of the second; but, in 1689, a third or supplemental volume was published; and the whole, revised, corrected, and enlarged by Leclerc, was afterwards printed at Amsterdam, 1691, in four volumes folio. To the imperfections of this Dictionary we are indebted for that of Bayle, who at first proposed only to correct the errors or supply the omissions of Moreri. Speaking of the faults of his predecessor, Bayle anxiously guards himself against being misunderstood: "I do not wish that the unfavourable idea which this may give of his work," says he, "should lessen the gratitude which is due to him. I enter into the sentiments of Horace respecting those who primarily show us the right road. The first authors of dictionaries have doubtless committed many faults; but they have earned a glory of which their successors can never deprive them." To the gratitude of posterity, which Bayle claims in favour of Moreri, the latter has an additional claim, arising from the circumstance of his having fallen a victim to the zeal with which he prosecuted his laborious undertaking; for excessive labour having exhausted his strength, he died at Paris on the 10th of July 1680, in the thirty-eighth year of his age, when only the first volume of the second edition of the Dictionary had passed through the press. The principal defect of Moreri's work consists in the inaccuracy of the geographical portion, in the awkward jumble of mythology and history, in his perplexed nomenclature, and the number and prolixity of his genealogies; but he has nevertheless the merit of being the author of the first work in which are found the names of all those personages who have any title to celebrity. Moreri was also the editor of the *Vies des Saints*, in three vols., the style of which he corrected, adding chronological tables; and of a *Relation Nouvelle du Levant*, or treatise on the religion, government, and customs of the Persians, Armenians, and other eastern nations, by Father Gabriel de Chinon. He had likewise collected materials for an historical and bibliographical dictionary of celebrated Provençals, and commenced a history of the Councils; and he further left in manuscript a treatise on new year's gifts. (A.)

Moresque ‖ Morgagni.

MORESQUE, Moresk, or *Morisco*, a kind of painting, carving, or other similar work executed after the manner of the Moors, and consisting of several grotesque pieces with compartments promiscuously intermingled, containing not any perfect figure of a man, or other animal, but only a wild resemblance of birds, beasts, trees, and the like. These are also called *arabesques*, and are particularly used in embroideries, damask, and other work of a similar kind.

Moresque Dances, vulgarly called *morrice dances*, are those arranged in imitation of the Moors, as sarabands, chacons, &c. and usually performed with castanets, tambours, and other instruments. There are few country places in England where the morrice dance is not known. It was probably introduced about the reign of Henry VIII.; and is a dance executed by young men in their shirts, with bells at their feet, and ribands of various colours tied round their arms, or flung across their shoulders.

MORETON-EN-MARSH, a township of the parish of Bourton-on-the-Hill, in the hundred of Westminster, and county of Gloucester, eighty-two miles from London, on the great road to Birmingham by Oxford. The ancient fossway from the west to the north of England runs through this town. The population amounted in 1801 to 829, in 1811 to 928, in 1821 to 1015, and in 1831 to 1331.

MORGAGNI, John Baptist, one of the greatest physicians of the eighteenth century, was born at Forli, in Italy, on the 25th February 1682. After having made rapid progress in the learned languages and belles lettres, he studied medicine at Bologna, where he remained several years, and then proceeded to Venice and Padua, in which places he made numerous experiments both in physics and in comparative anatomy. At the age of twenty-four he published his *Adversaria Anatomica prima*, and, in 1712, was appointed professor of the theory of physic at Padua. He then occupied himself with the continuation of his Anatomical Memoirs, in which he describes the intimate structure of a number of organs which had been ill observed before his time; refutes the criticisms of Bianchi, who had disputed some of his views; and exposes the errors which had been committed by Manget in his *Théâtre Anatomique*. This work was applauded by the greatest anatomists of the time, amongst whom may be mentioned Ruysch, Boerhaave, Heister, Winslow, Hoffmann, Mead, Senac, and Meckel. Morgagni was now promoted to the first chair at Padua, and successively admitted a member of the Royal Society of London, the Academy of Sciences at Paris, and the academies of Petersburg and Berlin, besides several learned Italian institutions. Morgagni continued to labour till the close of his long and honourable career, which terminated on the 6th of December 1771, at the age of nearly ninety. The knowledge of Morgagni was not confined to the medical art. His vast erudition embraced philology, criticism, history, and antiquities, as we gather from his works, of which the following is an enumeration, viz. 1. Adversaria Anatomica prima, Bologna, 1706, in 4to, altera et tertia, Paris, 1717, in 4to, quarta, quinta, et sexta, Padua, 1719, in 4to, Adversaria Omnia, Padua, 1719, in 4to; 2. Nova Institutionum Medicarum Idea, Padua, 1712, in 4to; 3. In Aurel. Cornelium Celsum et Quintum Serenum Samonicum Epistolæ quatuor, Hague, 1724, in 4to; 4. Epistolæ Anatomicæ duæ, novas Observationes et Animadversiones continentes, Leyden, 1728, in 4to; 5. Epistolæ Anatomicæ duodeviginti, Venice, 1749, in two vols. 4to; 6. De Sedibus et Causis Morborum per Anatomen indagatis, libri v. Venice, 1761, in

Morgarten ‖ Morison.

two vols. fol.; 7. Miscellanea Opuscula, Venice, 1763, in fol. The works of Morgagni were collected and published in an uniform manner by his disciple Antony Larber, under the title of *Opera Omnia*, Bassano, 1765, in two large volumes folio; and his life was written, first by Fabroni in the *Vitæ Italorum*, and next separately by Mossea, Naples, 1768, in 8vo. (A.)

MORGARTEN, a small village on a hill in Switzerland, on the frontier of the two cantons of Zug and Schwitz. It is of small extent and population, and only remarkable from its historical recollections. It was the field of the first battle fought by the Swiss for their independence in 1315, when they defeated the Austrians under Duke Leopold. It is situated on a small lake, which must formerly have been higher than it is at present, as the local circumstances of that battle do not exactly suit the present situation. It was also the battle-field in 1798, where the peasantry of Switzerland defeated the French invaders; and, finally, it was the spot where a division of the French army was defeated by the Austrians in 1799.

MORGHEN, Raphael, one of the most distinguished engravers that ever lived, was born at Naples in 1758. His father followed the profession of engraver, and from him young Morghen received his earliest instructions; but, in order more profoundly to initiate him in the art, he was afterwards placed as a pupil under the celebrated Volpato. He assisted this great master in engraving the famous pictures of Raffaelle in the Vatican, and the print which represents the miracle of Bolsena is inscribed with his name. He married the daughter of his master, and being invited to Florence to engrave the masterpieces of the Florentine gallery, he removed thither with his wife in 1782. All the works which he produced on this occasion were admirable; one in particular, the copy of Raffaelle's Madonna della Seggiola, is considered not only as the most excellent in the collection, but as a *chef-d'œuvre* of art. His reputation now became so great as to induce the artists of Florence to recommend him to the grand duke as a fit person to engrave Leonardo da Vinci's noble composition of the Last Supper, which adorns the wall of the refectory in the Dominican Convent at Milan. This picture is not only itself dilapidated, but the drawing which was made for Morghen being unworthy of the great original, the print of our artist, although an admirable production, fails to convey a correct idea of the style and merit of Leonardo. His fame, however, soon extended over Europe; and the Institute of France, as a mark of their admiration of his talents, chose him as an associate in 1803. In 1812, Napoleon invited Morghen to Paris, and paid him the most flattering attentions. A list of this great artist's works was published at Florence in 1810; the number comprised two hundred compositions, but subsequently to this period he produced a considerable variety of admirable prints. Amongst the most remarkable of Morghen's productions, besides those already mentioned, may be noticed the Transfiguration, from Raffaelle; a Magdalen, from Murillo; a Head of the Saviour, from Da Vinci; the Car of Aurora, from Guido; the Hours, from Poussin; the Prize of Diana, from Domenichino; the Monument of Clement XIII. from Canova; Theseus vanquishing the Minotaur; portraits of Dante, Petrarca, Ariosto, Tasso, and a number of other eminent individuals. Some remarks on the style and general merits of this artist will be found in the article Engraving. Morghen died in 1833, at the advanced age of seventy-five.

MORISON, Robert, physician and professor of botany at Oxford, was born at Aberdeen in 1620. He was bred at the university of that place, where he taught philosophy for some time; but having a strong inclination to botany, he made great progress in that science. The civil wars obliged him to leave his country, but he did not take this step until he had first signalized his zeal for the interest of the king, and his courage, in a battle which was fought between the inhabitants of Aberdeen and the Presbyterian troops, on the bridge of Aberdeen, in which he received a dangerous wound on the head. As soon as he was cured, he proceeded into France; and having settled at Paris, applied assiduously to the study of botany and anatomy. He was introduced to the Duke of Orleans, who committed to him the direction of the royal gardens at Blois. This office he exercised till the death of that prince, and afterwards came over to England in the year 1660. Charles II., to whom the Duke of Orleans had presented him at Blois, sent for him to London, and gave him the title of his physician, and that of royal professor of botany, with a pension of L.200 per annum. The *Præludium Botanicum*, which he published in 1669, procured him so much reputation, that the university of Oxford offered him the professorship of botany, which he accepted, and acquitted himself with great ability in the discharge of his duty. He died at London in 1683, aged sixty-three. He published a second and third part of his History of Plants, in two volumes folio, under the title of *Plantarum Historia Oxoniensis Universalis*. The first part of this excellent work has not been printed, and it is not known what has become of it.

Moritz, St ‖ Morlaix.

MORITZ, St, a small town of the canton of the Grisons, in Switzerland, in the Upper Engadin, where there are celebrated mineral springs of similar efficacy to those of Spa, Pyrmont, and Schwalbach, though less visited by invalids, from the insufficiency of the means of accommodation. It is situated 6060 feet above the level of the sea, in a wild and romantic district on the side of a lake at the foot of the granite mountain of Rozatsch; and the promenades offer prospects of the most exciting nature, amongst which are the cascade of the river, the lake of Silvaplana, and the extensive woods of Arvenwald. The visitors are chiefly from Italy, but some are from Germany, and from the other parts of Switzerland, and repair to the springs from June till the end of August; but in those months, from the great elevation, and from the glaciers around, warm clothing is found necessary. The permanent inhabitants do not exceed 500 persons.

MORLACHIA, a mountainous country of Dalmatia. The inhabitants, who are called *Morlacks* or *Morlacchi*, inhabit the pleasant valleys of Koter, along the rivers Kerha, Cettina, Narenta, and amongst the inland mountains of Dalmatia. They are by some said to be of Walachian extraction, as is indicated by their name, Morlachia being a contraction of *Mauro Walachia*, that is, *Black Walachia;* and the Walachians are said to be descendants of the ancient Roman colonies planted in these countries. This, however, is denied by the Abbé Fortis, who published a volume of travels in that country. He informs us that the origin of the Morlacchi is involved in the darkness of barbarous ages, like that of many other nations, resembling them so much in customs and language that they may be taken for one people, dispersed throughout the vast tracts extending from the Adriatic Sea to the Frozen Ocean.

With regard to the etymology of the name, the abbé observes, that the Morlacchi generally call themselves, in their own language, *Vlassi;* a national term of which no vestige is found in the records of Dalmatia until the thirteenth century. It signifies powerful men, or men of authority; and the denomination of *Moro-Vlassi*, corruptly *Morlacchi*, as they are now called, may perhaps point out the origin of the nation. This word probably signifies the "conquerors who came from the sea;" *moor*, *mor*, or *maur*, in all the dialects of the Sclavonian language, signifying the *sea*.

MORLAIX, an arrondissement of the department of Finisterre, in France, extending over 538 square miles. It is divided into ten cantons and fifty-eight communes,

Mornay ‖ Morocco.

and contains 136,535 inhabitants. The capital is the city of the same name, situated at the junction of the Jaclot and Offen, which form a haven, with a well-defended entrance. A considerable trade is carried on from this place with Spain and Portugal, to which are exported the linens well known by the names of *Creas* and *Bretagnias*; but of late years this trade has diminished. In the year 1836 the city contained 9740 inhabitants. It was the birth-place of the celebrated General Moreau. Long. 3. 53. 35. W. Lat. 48. 33. N.

MORNAY, PHILIPPE DE, Seigneur Duplessis Marly, was born at Buhy or Bishuy, in Upper Normandy, in France, in 1549, and was educated at Paris. He made a rapid progress in the belles lettres, in the learned languages, and in theology, which was then thought a prodigy in a gentleman. At first he was destined for the church; but the principles of Calvinism, which he had imbibed from his mother, effectually excluded him from the ecclesiastical preferments to which, by his interest, abilities, and birth, he would have been entitled. After the horrible massacre of St Bartholomew, Philippe de Mornay made the tour of Italy, Germany, England, and the Low Countries; and he was equally improved and delighted by his travels. Mornay afterwards joined the king of Navarre, at that time leader of the Protestant party, and since so well known by the name of Henry IV. This prince sent Mornay, who employed his whole abilities, both as a soldier and a writer, in defence of the Protestant cause, to conduct a negociation with Elizabeth queen of England; and left him wholly to his own discretion in the management of that business. He was successful in almost every negociation, because he conducted it like an able politician, and not in a spirit of intrigue. He tenderly loved Henry IV. and spoke to him upon all occasions as to a friend. When he was wounded at Aumale, he wrote to him in these words: "Sire, You have long enough acted the part of Alexander, it is now time you should act that of Cæsar. It is our duty to die for your majesty. It is glorious for you, Sire, that I dare venture to tell you it is your duty to live for us." This faithful subject did every thing in his power to raise Henry to the throne; but when he deserted the Protestant faith, he reproached him in the bitterest manner, and retired from court. Yet Henry still loved him, and was extremely affected with an insult which he received in 1597, when one Saint Phal beat him severely with a cudgel, and left him on the ground for dead. Mornay demanded justice from the king, who gave him the following answer, a proof as well of his spirit as of his goodness of heart. "Monsieur Duplessis, I am exceedingly offended at the insult you have received; and I sympathize with you both as your sovereign and your friend. In the former capacity, I shall do justice to you and to myself; and had I sustained only the character of your friend, there are few perhaps who would have drawn their sword or sacrificed their life more cheerfully in your cause. Be satisfied, then, that I will act the part of a king, a master, and a friend." Mornay's knowledge, probity, and valour, made him the soul of the Protestant party, and procured him the contemptuous appellation of the *Pope of the Huguenots*. He defended their doctrines both by speech and writing. One of his books, on the Iniquity of the Mass, having stirred up the Catholic divines, he refused to make any reply to their censures and criticisms except in a public conference. This was accordingly appointed to be held in the year 1600, at Fontainebleau, where the court then was. The two champions were, Duperron bishop of Evreux, and Mornay. After a great many arguments and replies on both sides, the victory was adjudged to Duperron. He had boasted that he would point out to the satisfaction of every one five hundred errors in his adversary's book, and he partly kept his word. The Calvinists did not fail to claim the victory on this occasion, and they still continue to do so. But this conference, instead of putting an end to the differences, was productive of new quarrels amongst the controversialists, and of much profane wit amongst the libertines. A Huguenot minister, who was present at the conference, observed with great concern to a captain of the same party: "The bishop of Evreux has already driven Mornay from several strongholds." "No matter," replied the soldier, provided he does not drive him from Saumur." This was an important place on the river Loire, of which Duplessis was governor, and whither he retired, his attention being constantly occupied in defending the Huguenots, and in making himself formidable to the Catholics. When Louis XIII. was making preparations against the Protestants, Duplessis wrote him a letter, dissuading him from such a measure. After employing the most plausible arguments, he concludes by observing, that to make war on the subject, is an indication of weakness in the government. "Authority," says he, "consists in the quiet submission of the people, and is established by the prudence and justice of the governor. Force of arms ought never to be employed except in repelling a foreign enemy. The late king would have sent the new ministers of state to learn the first elements of politics, who, like unskilful surgeons, would apply violent remedies to every disease, and advise a man to cut off an arm when his finger aches." But these remonstrances produced no other effect than the loss of the government of Saumur, of which he was deprived by Louis XIII. in 1621. He died two years afterwards, on the 11th of November 1623, aged seventy-four, in his barony of La Foret-sur-Seure, in Poitou.

The following is a list of his works: 1. Un Traité de l'Eucharistie, 1604, in folio; 2. Un Traité de la Vérité de la Religion Chrétienne, 8vo; 3. A book entitled La Mystère d'Iniquité, 4to; 4. Un Discours sur le Droit prétendu par ceux de la maison de Guise, 8vo; 5. Curious and interesting Memoirs from the year 1572 to 1629, four vols. 4to, valuable; 6. Letters, which are written with great spirit and good sense. David des Liques has published a life of De Mornay, in a quarto volume, which is more interesting for the matter than the style.

Morning ‖ Morocco.

MORNING, the beginning of the day, or the time of the sun rising. The astronomers reckon morning, *mane*, from the time of midnight to that of mid-day.

MORNING STAR, the planet Venus when a little to the westward of the sun; that is, when she rises a little before him. In this situation she is called by the Greeks *Phosphorus*, and by the Latins *Lucifer*.

MORNINGTON ISLE, one of the group of islands which Captain Flinders calls Wellesley's Islands. It is situated on the north coast of New Holland, at the head of the Gulf of Carpentaria. It is thirty-five miles long and ninety in circumference; and is inhabited, though nothing is known of the natives. Long. of Cape Van Diemen, its eastern point, 139. 49½. E. Lat. 16. 32. S.

MOROCCO.

MOROCCO, or MAROCCO, a large empire in the north-west part of Africa, is a remnant of the great African monarchies which owed their origin to the Saracens, and the most extensive and important of the Barbary States. It is bounded on the north and west by the Mediterranean and the Atlantic respectively, on the south its limits are

Morocco. defined by the great desert of Sahara, and on the east it is separated from Algiers by the river Moulouia or Mulwia and the mountains of Trava. It is about 550 miles in length, lying between 29° and 36° of north latitude, and 2° and 10° of west longitude; its average breadth may be about 130 miles; and, according to Mr Washington, it contains a superficies of 150,000 square miles. This large territory is separated into four grand divisions, answering to the four kingdoms into which it was originally divided, namely, Fez or Fas, Morocco, Suz, and Tafilet, according to the following table:

Northern provinces, or kingdom of Fez.

	Chief Towns.
El Gharb	Tangier, Tetuan, Al Kayarr, El Araïsh.
El Rif	.....
Beni Hassan	Rabatt, Slaa (*Salee*), Mehedia.
Temsena and Shawiya	Darel Ceida, Fidallah.
Fas	Fas, Mekinez.

Central, or kingdom of Morocco.

Ducaila	Azamor, Mazagau.
Shragna	Al Cala.
Abda	Saffy.
Shedma	Mogadore.
Haha	.....
Rhamna	.....
Morocco	Morocco.

Southern, or kingdom of Suz.

Suz	Agadir, Tarudant, Irnoon.
Draha	.....

Eastern, or kingdom of Tafilet.

But the whole of the country comprised in these divisions belongs rather nominally than really to the Emperor of Morocco; for the Arabs beyond the southern bank of the Suz avail themselves of their great distance from the seat of government, and other local advantages, to disregard the mandates of the emperor, so that they can scarcely be said to acknowledge his sovereignty.[1] The grand physical feature of Morocco is the Atlas mountain chain, which traverses it first from east to west, then from north to south, and again from east to west, till it terminates at Cape Nun, upon the shores of the Atlantic. Offshoots or ramifications of this stupendous mountain spine intersect the country in various directions, and some of them attain a great elevation. Miltsin, the highest peak of Atlas visible from Morocco, a distance of seventy miles, and not two hundred, as has been uniformly asserted, is 11,400 feet above the level of the sea. This is below the limit of perpetual snow assigned by Humboldt in his Personal Narrative; yet only once in twenty years had these summits been seen entirely destitute of snow. At 6400 feet above the level of the sea, which was the highest point reached by Mr Washington in 1830, the mountain, he informs us, "was of a hard, red sandstone, the strata running in an east and west direction, and dipping 10° south." Mr Washington continues: "We had thus only passed limestone,[2] micaceous schist, and sandstone, that is, transition and secondary rocks; no traces of the primitive, except a boulder of granite, or rather of gneiss, in the valley below, and veins of foliated quartz in the schistose hills. Besides, the tendency of the formation is to table-land, ridges, and rounded summits, not to sharp or Alpine peaks; neither did we on our route through the country see any trace of volcanic agency, nor is there any thing in the outline of Atlas indicating the former existence of a crater." At the height of 2400 feet the mountain consisted of a strata of lime running north-east and south-west, the dip about 70° to south-east, and which followed the undulation of the hills. There is a range of hills which presents a striking appearance, even as seen from Morocco. It is called the Arina range, and consists of a basis of lime; "strata east and west; dip 20° to the south-east; its north-western face precipitous, five hundred feet high, and deeply channelled with the water-courses, and having dark-red clay, possibly metallic, between the strata of lime." At the foot of Atlas is a range of schistose hills, varying from five to eight hundred feet in height, and assuming every variety of shape, "truncated cones, pyramidal, pine apple, sugar loaf, &c.; one of which was covered with masses of gneiss, or coarse-grained granite, abounding with black mica; many of these blocks were several tons weight." These quotations will serve to convey an idea of the more remarkable geological features of the country. The rivers are comparatively few in number, and, except near the sea, are small in size. The most considerable are the Moulouia or Mulwia, the Seboo, the Oom-erbegh, the Tensift, and the Suz. All these, except the first, fall into the Atlantic. The Oom-erbegh (mother of herbage) has the longest course of any river in the empire. It rises in that part of the Atlas chain which separates the provinces of Fas and Tedla, and forms the boundary between Temsena and Ducaila. After a very winding course of above two hundred miles, it falls into the Atlantic at Azamor, where it is about one hundred and fifty yards wide. It has been conjectured that the Mulwia derives its origin from the opposite side of the same mountain, and that in this quarter are situated the highest summits of the Atlas range; but this has not yet been determined. "The river Tensift," says Mr Washington, "springing from the northern hills, about forty miles eastward of the city, flows along at their base about four miles north of Morocco, and, joined by several streamlets from Atlas, reaches the Atlantic fifteen miles south of Saffy, nearly one hundred miles distant; the river is shallow, but rapid; the channel here (on the plain of Morocco) about three hundred yards wide, but fordable, except in the spring, in almost all places." Several considerable streams, which derive their origin from widely-separated parts of the Atlas chain where it traverses Fas, unite and form the river Seboo. The principal head branches are the Wad Werga and Wad Leoen; the latter is joined by another stream larger than itself, but without a name. As it approaches the ocean, the Seboo winds in "the boldest sweeps imaginable, through a rich and varied plain." It is "about four hundred yards wide; a bar of sand, a quarter of a mile from its outlet, extends almost across, and is nearly dry at low water spring tides; inside from three to four fathoms wa-

[1] By far the best geographical description of Morocco, and the most correct map hitherto completed of that empire, will be found in the Journal of the Royal Geographical Society of London. They are by Lieutenant Washington of the navy; and his valuable communication was read in 1831. It does not appear to have been seen by some recent writers on geography, a circumstance which will account for some discrepancies between the present article and other accounts of the empire of Morocco, particularly in reference to the latitude and longitude of places.

[2] "This formation, it is believed, is of secondary limestone, and probably is generally diffused throughout the skirts of the Atlas, forming the basis of all the lower ranges of the mountains, to the height, perhaps, of three or four thousand feet. Of marble we saw nothing in our journey, except in some of the buildings in Morocco; and, after much inquiry, could not decide, from the ignorance or apathy of the Moors, whence it came, but it is believed from Italy. The great columns and pillars of white marble yet existing in this country are between Fez and Mekinez, and described as the ruins of a triumphal arch and temple; but of *rosso-antico*, and other ancient marbles, which have been historically almost proved to have come from Mauritania, we could hear nothing."

Morocco. ter; rise of tide seven or eight feet." The town of Mehedia stands upon the southern bank of the river; and between it and the city of Fas, situated about eighty miles in the interior, but more than double that distance measured by the windings of the river, there is water communication, of which, however, no advantage is taken. About twenty miles to the south-west of the Seboo, the Bu Regreb falls into the Atlantic at Slaa or Salee, a place renowned in the annals of piracy. This river is formed by the junction of the Weroo and Bu Regreb. It is about four hundred yards broad at its mouth at full tide. These are the principal streams in Morocco. They have all several tributaries, and there are besides a considerable number of rivulets, which flow directly to the ocean. There are a few lakes, one of which, called Murja Ras ed Dowra, is twenty miles in length by one and a half in breadth.

Except during three months in summer, the climate is mild in temperature, pleasant and salubrious even to Europeans; whilst the country, generally speaking, is free from those marshy tracts which, in the tropical regions, are the pregnant source of the most malignant forms of disease. In the northern provinces the climate is nearly the same as that of Spain, having the autumnal and vernal rains peculiar to the south of Europe. Towards the Great Desert, however, the rains are less general and certain, and the heat in consequence is more oppressive. Indeed, to the south of the river Suz, little or no rain falls throughout the year. We may, however, observe generally, that, throughout the emperor's dominions, the air has for the most part a congenial softness, and a degree of serenity, which render the climate peculiarly delightful. The sea-port towns have the additional advantage of being frequently refreshed with sea-breezes.

The soil of Morocco varies in its nature and quality, yet in general it is in the highest degree productive, and, under proper cultivation, is capable of producing all the luxuries of the eastern and western hemispheres. Some parts of the sea coast, it is true, are sandy and barren; but the plains of the interior consist of a rich black loam of extraordinary fertility. The mountainous parts might also be rendered extremely productive, if the inhabitants did not almost entirely neglect agriculture. It is a rule which scarcely admits of an exception, that where nature does much for man, he does little for himself. Yet notwithstanding the slight cultivation which it receives, the soil is so fertile, that fruit and grain are produced, not only in quantities sufficient for the wants of the people, but also for exportation. Morocco formerly supplied a part of Spain with the necessaries of life, but of late years the exportation of corn has been totally prohibited. The principal grain is wheat. Barley is likewise abundant, and oats grow spontaneously. Indian corn, peas, beans, hemp, tobacco, and a great variety of esculent vegetables, are amongst the products of the soil. All the culture which it receives consists merely in burning the stubble before the autumnal rains commence, and then ploughing it about six inches deep. The olive in its best state, the citron, the orange, and the cotton tree, cover the hills; and experience has proved that sugar, rice, and indigo may be raised to much advantage, and at a very trifling expense of labour. Many varieties of the vine succeed in the northern provinces; and figs, dates, pomegranates, melons, almonds, peaches, apricots, pears, cherries, plums, and, in short, all the fruits to be found in the southern provinces of Spain and Portugal, are produced in abundance. The natives preserve their grain in "matamores," or holes made in the earth, lined and covered with straw, to prevent the rain from soaking through; and in these receptacles grain may be kept fresh for five or six years. The forests of Morocco are full of oaks with sweet acorns, cork-trees, cedars, arbutuses, and gum-trees. Copper, tin, iron, antimony, and other metals, including silver and gold, are found in various parts; but as the Moors are ignorant of mining operations, they have proved of little value to the country. Morocco.

In describing topographically the provinces of Morocco, we shall commence with the most northerly. For an account of Fez, however, it is only necessary to refer to the article under that head. The next place in importance is the sea-port of Tangier, situated on a steep acclivity rising at once from the beech, long. 5. 48. and lat. 35. 47. 54., thirty miles west-south-west of Gibraltar. It is surrounded by mouldering walls, with round and square towers at short distances, and three strong gates. Its defences toward the sea consist of two batteries, one above the other, on the south side of the sea-gate. High upon the wall, and directly in front of the landing-place, are about twelve guns; to the north, in a circular battery commanding the bay, which is about three miles wide, are twenty more guns, of all calibres, but in very bad condition; and, crowning the whole, to the north is an old and extensive castle, the residence of the governor. On the land side, walls and a ruined ditch form the only defences. The gates are shut at sunset, and a watch is set at night. With the exception of the main street, which crosses the town irregularly from the sea to the land-gate, the streets are narrow and crooked. The houses are low, with flat tops, except those of the European consuls, many of which are good. El Jaama Kibeer is large and rather handsome. Its tower, placed at the north-west angle, is lofty, and wrought in coloured tessellated work, as is also the pavement of the mosque, round which sweeps a colonnade of low pillars, with a fountain in the centre. There are two public markets well supplied with vegetables, fruits, poultry, game, and meat, which is good and cheap. The town is the residence of a pasha, whose territory extends about twenty-five miles to the southward. Outside the walls are some productive gardens belonging to the different consuls resident here, who, with their families, are numerous enough to form a very agreeable society. The anchorage in the bay is very tolerable, excepting in strong north-west winds. Were the mole rebuilt, the remains of which are still visible under water, the landing on the beach would be always secure. The ruins of Old Tangier, supposed to be the Tingis of the ancients, and a Roman bridge, are still standing at the southern part of the bay. Four small batteries, of about six guns each, defend the sand-hills around the shores. This town was long a subject of eager contention between the Moors and Portuguese; but the latter obtained possession of it in 1471, and kept it for nearly two centuries, when it passed into the hands of the English as part of the marriage portion of the queen of Charles II. It was wisely abandoned by Britain about twenty years afterwards. The population of Tangier is from seven to eight thousand, including fifteen hundred Jews, who are the chief artisans.

Thirty miles south-east of Tangier is Tetuan, pleasantly situated near the opening of the straits into the Mediterranean, in long. 5. 24. lat. 35. 36. It is built upon a rising ground between two ranges of high mountains, one of them forming a part of the lesser Atlas. The town is of considerable extent, and has defences nearly of the same description as those of Tangier. The streets are narrow and filthy; the houses are two stories in height, but they have a mean appearance from the streets, which in many instances are nearly arched over by them. The El Kaisseria, or fair, for the disposal of goods, is filled with shops, which are well supplied with almost every variety of goods, both of European and African manufacture. The latter are brought by means of the annual caravans from Fez, and the former by vessels from Spain and from Gibraltar. They have, besides, many manufactures of their own, so that Tetuan may be ranked next to Fez in commercial importance. The mosques are large and numerous. The port is situat-

Morocco. ed on a river about two miles from the sea, and is named Marteen; but only small craft can reach it, as the stream is nearly choked up with sand. The entrance is defended by a high square tower, on which are mounted twelve pieces of ordnance. The population of Tetuan was formerly estimated at 20,000, but it is supposed to be now considerably below that number.

Nearly midway between Tetuan and Tangier is Ceuta, formerly the capital of *Hispania Transfretana*, and occupied by the Moors. It was afterwards taken by the Arabs, and again in 1415 reduced by the Portuguese, from whom it passed into the hands of the Spaniards, in whose possession it now remains. Being a commanding position, it acquired great value in the eyes of the maritime states, as affording the means of checking the Barbary pirates; and to the Spaniards, in particular, its importance has not been diminished by the loss of Gibraltar. Various efforts have been made by the sovereigns of Morocco to recover it; but as it is almost impregnable on the land side, a military force, without the aid of a fleet, must for ever prove ineffectual. It is situated in long. 5. 17. 25. lat. 35. 54. 10. Between this place and Tangier, which is distant about a day's journey, the whole coast is rugged, and interspersed with projecting cliffs. About twenty miles to the west of Cape Spartel, and five miles west from Tangier, stands the town of Arzilla, in long. 6. 0. and lat. 35. 29. 30. It is a walled square of about a quarter of a mile, situated on the open beach. The walls, which were built by the Portuguese, have a few guns mounted on them on the side facing the sea. The population may be about 1000. The next place of any consequence on the coast is El Araïsh, which is situated on an abrupt declivity of sandstone, upon the southern bank of the river El Kos, at its outlet into the Atlantic, in long. 6. 9. and lat. 12. 50. The town is walled, and strongly defended, on the land side by a ditch and a citadel, and towards the sea by a battery of thirteen guns and a venerable castle, with concave flanks and orillons. El Araïsh is a picturesque ruin. Moslemin superstructures are reared upon the foundations of Christian temples; the principal mosque was once a Roman Catholic church. Here was formerly the residence of European consuls, and their deserted houses still line the Marina, commanding a fine view of the port and of the Atlantic. Supplies are abundant, and there is some little commerce in charcoal and other articles; but the town is fast falling to decay. The population may amount to about 4000, including Jews. The river El Kos, signifying a bow, and so named from its windings, may be traced through a beautiful valley far away to the eastward. Its banks are fertile, and enriched by many gardens; which fully justifies the propriety of bestowing its present name on the town, El Araïsh, or the flower gardens. From an inscription over the walls on the sea-gate, it appears that this place was taken from the Moors, and fortified, by the Spaniards, in 1610.

The route of Mr Washington from Tangier to the capital of Morocco passed through all the towns of importance in the empire with the exception of Fez and Mogadore, as well as some of the most fruitful and populous parts of the country. Leaving Tangier, the road leads in a south direction "over a sandy soil, through the productive gardens that surround the town; then through an undulating country, over rounded schistose hills, about 300 feet high; mica slate, with veins of foliated quartz, occurring rarely; direction north-west and south-east; dip of strata 75° to south-west, and covered with scanty herbage; passing occasionally an Arab village of a few hovels, fenced by a hedge of aloes and prickly pear, or Indian fig; here and there a patch of Guinea corn; otherwise no signs of cultivation." The road then proceeds ten miles south by west over a hill called Dahr Acclaou, well wooded with cork, wild olive, droo, myrtle, heath, broom, palmetto, and other trees and shrubs. It then winds ten miles in a southerly Morocco. direction through a valley about eight miles wide, abounding in springs, and having a soil of light clay, but little cultivated. Proceeding southwards, Mr Washington passed several tracts of rich alluvial soil, woods of fine cork trees, and numerous Arab villages, the country becoming more populous, and presenting traces of higher cultivation. The Arabs possessed herds of cattle, horses, mules, and flocks of sheep. The first place of any importance is the town of Al Ksar, situated in a flat tract of rich, partially wooded meadow-land, through which meanders, in a west-north-west direction, the river El Kos, a rapid but shallow stream, and about an hundred yards wide in November. The plain to the south-east is bounded by beautiful mountain scenery; and conspicuous, by its singular conical form, arises the peak of Sarsar, at the foot of which, said to be inhabited by Shereefs, is the town of Wazen.

Al Ksar, situated about half a mile from the river on its northern bank, in long. 5. 52. lat. 34. 57. 10., is surrounded by orchards and gardens of orange, pomegranate, and palm, in great luxuriance. It was built by Jacob, son of Almansor, about the end of the twelfth century, and is connected in history with the wars of Granada. The town is encompassed by old ruinous walls about a mile and a half in circumference, and having loopholes, battlements, and small square towers fifty paces apart. The streets are narrow, and at intervals arched across. The houses are remarkable for having ridged roofs of tile. Mr Washington counted fourteen mosques, many of which were lighted up and spacious; and the bazaar contained a few mean shops, but no business was doing, markets and inns being deserted and lifeless. The population amounts to about 8000, of which 500 may be Jews; but doubtless it had once been much more populous.

The course now lay through a succession of valleys and over low ranges of hills to the great plain of Mamora, over which herds of cattle range. As the travellers entered the grazing country, Arab villages changed into *douars*, or circular encampments of from twenty to thirty tents. Approaching the Atlantic by a south-westerly course, Mr Washington reached the large lake called Murja Ras el Dowra, which extends parallel with the coast nearly twenty miles. It contains several islands, with saints' tombs, insulated spots being here, as well as elsewhere, sacred to holy purposes. The lake was covered with wild fowl of every description, and fine eels are obtained from its waters. The surrounding margin exhibits little or no trace of cultivation; but the soil, although light and sandy, is productive of various annual plants, and on the western shore is a forest. The Arabs have here a great number of douars and coubbas. The country now became hilly, and the soil gravelly and sandy, but producing colocynth and coarse herbage. Mr Washington next crossed the Wad Seboo, and entered the town of Mehedia, which is situated on a height of about ten feet, on the southern bank of the river, and about ten miles from the sea, in long. 6. 36. and lat. 34. 18. When in possession of the Portuguese it was a place of some consequence, as the ruins of handsome fountains, arches, churches, and fortifications attest. It had a double wall, and was otherwise well fortified; but at present eight mounted guns constitute its sole defence. The town now contains only 300 or 400 inhabitants, chiefly fishermen, who subsist by the sale of shebbel, a fish resembling salmon, which is here caught in great abundance. Between this place and Salee, about sixteen miles to the south-south-west, is the extensive forest of Mamora, said to cover eight miles of country. It is chiefly inhabited by lions and wild bears. Passing under an ancient aqueduct extending a mile in length, having arches thirty feet high, eight feet wide, and four feet thick, Mr Washington entered the town of Salee.

Morocco. Slaa, or Salee, once the terror of the seas, and renowned for those rovers whose daring exploits spread terror along the shores even of Christendom, and whose city and port were a constant scene of riot, bustle, and activity, is now ruined, silent, and desolate. The present town, built on a sandy point extending to the sea, and forming the north-eastern bank of the river, is about half a mile in length by a quarter of a mile in breadth. It is surrounded by walls thirty feet in height, having square towers at every fifty paces. The defences are a long battery of twenty guns facing the sea, a round fort at the entrance of the river, and a gun or two on the gates. The mosques, arches, and fountains in the city appear to be of high antiquity, and show traces of beautiful sculpture; but the streets are narrow, and the houses, like those of all Moorish towns, are sombre. The population is about ten thousand, of whom five hundred may be Jews, who apparently have little or no occupation. The river Bu Regreb is here about five hundred yards broad when full. The bar, about one eighth of a mile from the entrance, runs almost across in a west-south-westerly direction, with three or four feet on it at low water, but leaving a channel at each end. The Moors use the eastern, where there is a rise of nine or ten feet of tide; and inside the harbour is quite sheltered, with water sufficient for a frigate. The imperial dock-yard is here, and ship-building is carried on to a small extent. The presence of several ferry-boats, some small traders, and a few fishing boats, give to this river an animated appearance quite uncommon amongst the Moors.

The town of Rabatt stands on the south-western side of the Bu Regreb, fifty or sixty feet above its level, upon banks of crumbling sand-stone. With its minarets, palm-trees, ruined walls, old mosques, and, crowning the whole, its venerable *kassbah*, or citadel, with its battlements all grouped in the most picturesque manner, it has an imposing appearance from the opposite shore. It extends three quarters of a mile in length by about one third of a mile in breadth, and is defended towards the sea and the river by three batteries and the citadel, and on the land side by a strong wall thirty feet in height, with square towers and angles of masonry. The main street of Rabatt, which runs parallel to the river, contains the principal shops, which are not very attractive, and the markets, which are abundantly supplied with excellent fruits and vegetables. The orange orchards, vineyards, and cotton plantations, are extensive. The most conspicuous object is the ruined mosque, and lofty tower, called by the Moors Sma Hassan, which stands two hundred and twenty feet above the level of the river. Mr Washington counted ten mosques, besides the mausoleum of a sultan, and that of the hero of Moorish Africa, the great Almansor. The Moorish population may amount to eighteen thousand, and the Jewish to about three thousand. The Jews are the chief artisans, and they have a part of the town allotted to them, called *Millah*, which is exceedingly filthy. Rabatt is situated in lat. 34. 2. 30. N., and long. 6. 46. W. One mile south-east of the town are the ruins of the Roman or Carthagenian town called Shella, formerly a place of note, and, according to D'Anville, the limit of the Roman station on this coast. Several ancient but ruined towns and villages were passed by Mr Washington, amongst which were Tomana, distant seven miles from Rabatt and three from the coast; El Mansoria, a square of one hundred and fifty paces, enclosing an Arab village, in lat. 33. 46. 10. N., and long. 7. 20. W.; Fidallah, situated six miles from El Mansoria, on a fine corn plain, at three quarters of a mile from the sea, and employed as a magazine for grain before Mogadore was built; and, lastly, Dar el Beida, a small walled town about half a mile square, which stands on a point projecting into the sea, and forming a bay three quarters of a mile deep. The roadstead is well sheltered from westerly winds, and protected by a few pieces of cannon. The town was built for the exportation of corn, and was long in possession of the Portuguese. It is walled in, has three mosques, several houses built in the European style, and a population of about seven hundred, including Jews. Morocco.

Between this place and Azamor, thirty-three miles distant, the country presents a rich and varied appearance, and the signs of cultivation become more conspicuous. There are numerous gardens, a forest of a beautiful evergreen tree called *droo*, resembling the *arbutus* in blossom, and bearing a brown berry which yields a coarse species of oil. Mr Washington saw many ploughs at work; large plantations of henna, herds of cattle, flocks of sheep and goats, and a great number of Arab encampments.

On the south-western bank of the river Oom-erbegh, one mile and a half from its outlet, stands the town of Azamor, in lat. 33. 17. 37. N., and long. 8. 15. W. It is surrounded by a wall about a mile and a half in circumference, but in ruins. The streets are narrow and filthy, and the town is dull and lifeless, maritime trade being interrupted by a bar of sand across the mouth of the river. The population may be about three thousand, including Jews. The surrounding country is open and destitute of wood, but well cultivated, and laid out in plantations of henna, of which three crops a year can be produced by irrigation. At a few miles distance from Azamor is the town of Mazagau, situated on a peninsular point projecting north about one mile, and forming with another point a sandy bay about a mile and a half in depth, which affords a good roadstead for small vessels. The town is well built, and respectably defended towards the sea by several redoubts. It enjoys some little commerce, has excellent water, and is well supplied with provisions. The population amounts to about two thousand, including Israelites. It is situated in long. 8. 21. W. and lat. 33. 15. N.

The course of Mr Washington now lay through the interior of the province of Ducaila, celebrated for its breed of horses, and its woollen manufactures of sulhams, haicks, carpets, and the like. The soil of the plain is a light loam, covered with stones, flint, and the like. It is well cultivated, and laid out in gardens and Indian corn fields. With the exception of a few scattered palm-trees, there is no wood; but the Arabs encamp here in great numbers, as herds of cattle and flocks of sheep find plenty of pasture, and are supplied with water from several springs and wells. The plain is of vast extent, and presents many varieties of vegetation; palmetto and colocynth occurring in swampy spots, fine grass occasionally, patches of Guinea corn, gardens, and so on. Mr Washington passed a large market on the great plain, where camels, horses, mules, asses, rude implements of husbandry, coarse woollen manufactures, corn, vegetables, fruit, dates, almonds, henna, and other articles, were exposed for sale. Ducaila may be described as a succession of plains, the largest being that on which the imperial city stands. The plain of Morocco extends in an east and west direction, between a low range of schistose hills to the north, and the lofty Atlas to the south; it is about twenty-five miles wide, and apparently a dead flat to the foot of the mountains. It lies about fifteen hundred feet above the level of the ocean, and, as far as the eye reaches east or west, appears to have no limit. This vast level plain, therefore, may stretch from the shores of the Atlantic on the west, to the foot of the Atlas on the east, a distance of about two hundred miles. This tract of country, however, does not all go by the name of Morocco, portions of it to the east and west being distinguished by other appellations. The soil is a light sandy loam, interspersed with numerous rounded stones of crystallized quartz, agates, porphyry, a green stone, carnelians, and other minerals. It is, generally speaking, covered with low brushwood of the thorny plant called *sidra nebach*, or buckthorn. The banks of the streamlets are fringed with

Morocco. oleanders of great beauty, whilst to the north a forest of palm trees and olives, and to the south the towering snow-clad summits of the Atlas mountains, impart a picturesque grandeur to the scene.

Morocco, the capital of the empire, is situated on the northern side of this rich plain, the principal mosque standing in latitude 31. 37. 40. north, and longitude 7. 36. 0. west. It is surrounded by a strongly-built machicolated wall of tapia-work, thirty feet high. The foundations are of strong masonry; square towers are placed at intervals of fifty paces; there are eleven strong double gates; and the whole is six miles in circumference. This vast area, however, is far from being entirely occupied with buildings; it also comprehends large gardens and open spaces from twenty to thirty paces in extent. Of the eleven gates of the city now open, that which conducts to the palace of Beb el Rom is by far the best specimen of architecture to be seen. It is a Moorish horse-shoe arch, richly sculptured in arabesque work, in imitation of shoe-nails, and the like; and however false in principle such a plan of an arch may be, it is said to have a pleasing effect to the eye. The streets of Morocco are narrow and irregular, seldom wider than lanes in European cities, and in many cases the lines of houses on either side are connected by bridges with gates, possibly intended for defence in case of attack. Several open spaces, which scarcely deserve the name of squares, are used as market-places, and for other purposes. The houses, which are generally stony, have flat roofs and terraces, the side towards the street being plain and white-washed. As an apology for windows, there are here and there narrow unglazed openings; but the interior disposition of the tenement is much in the Spanish style. Many of the doors are of cypress wood, and highly sculptured. The rooms, which are long and narrow, open into a court, sometimes surrounded with arcades, and having a fountain in the centre. With the exception of a mat and a cushion or two, they are destitute of furniture, which, with the want of windows and fires, conveys to a European any thing but an idea of comfort and convenience. On the outside of the southern main wall, and facing the Atlas, stands the palace of the sultan. It is encircled by a wall equal in strength to that which surrounds the city, and occupies an area fifteen hundred yards in length by six hundred in breadth. The whole is portioned into squares laid out in gardens, round which are detached pavilions, forming the imperial residence. The floors of the rooms are tessellated with variously coloured tiles, but otherwise they are quite plain, the furniture consisting only of a mat, a small carpet at one end, and some cushions. Within the city there are nineteen mosques, two emdrasas or colleges, and one hospital. El Koutubia, the principal mosque, stands alone in a deserted place of twenty or thirty acres, and is conspicuous above all by its lofty square tower rising to the height of two hundred and twenty feet without diminishing, thus producing a striking and singular effect. It is divided into seven stories, and its height is apparently about seven times its diameter. This tower resembles, and is said to be coeval with, the Sma Hassan at Rabatt, and the Giralda at Seville, built towards the close of the twelfth century, but reconstructed by Christians in the thirteenth century. Upon the summit of the tower of El Koutubia is a small turret, in the shape of a lanthorn, from which it derives the name of Sma el Fanar. The body of the mosque, although large, is an irregular building, and insignificant when contrasted with the lofty tower by which it is surmounted. Next in height, and coeval in erection, although modernized and well painted, is the mosque of Beni Yussuf. It has a college of talebs, that is, seekers or students, attached to it; and a saint's tomb stands opposite its southern door, formed of three arches, and surmounted by a cupola, delicately wrought with rich Saracenic tracery. El Moazin, said to be the most ancient sacred edifice, is very large, and has several courts opening into each other. The Moorish horse-shoe arches intersect each other in various directions, and have a very rich effect. Attached to this mosque are gates, said to have been carried away in triumph from Seville by the great Almansor, as our Henry VIII. did those of Boulogne. The patron saint of the city is called Bel Abbas. This mosque is composed of a square saloon, covered with an octangular cupola, carved and painted with arabesques, and on the outside covered with varnished and coloured tiles. The sepulchre of the saint is richly ornamented, and on one side of it is placed the alms-chest. Adjoining the mosque are various court-yards, with arcades and rooms to lodge poor, old, maimed, and invalid people. The hospital is capable of containing fifteen hundred patients; and this place is also a sanctuary or house of refuge for those who are persecuted by despotism. Here they find a never-violated asylum, and can negociate till pardon is obtained. The chief of this establishment bears the title of El Emkaddem, or the Elder, and is venerated as a saint. The college and mosque called Emdrasa del Emshia stands near the south wall of the city. Here are the sepulchres of the sultans of the Moluc Saidia dynasty, once adorned with statues and busts, which a bigoted Moslemin emperor caused to be effaced. The other mosques it would be superfluous to describe. Morocco.

The Great Bazaar, called El Kaisseria, is a long range of shops, or rather stalls, protected from the weather, and divided into compartments. The articles which Mr Washington saw exposed for sale were, silk scarfs, shawls, and handkerchiefs, from Fez; sulhams, haicks, gellabias, and carpets, from Ducaila; cloth, linen, hardware, tea, and sugar, from London; almonds, raisins, henna, and al kohol, from Suse; very fine corn, caravances, beans, and the like, from Shragna; very luscious dates from Tafilet; and abundance of boots, slippers, saddles, coarse pottery, mats, cord, &c. of domestic manufacture, together with embroidery in gold and silver, in which they particularly excel. There are two or three markets, the principal of which is called Sok el Khamise. It is held near the north gate of the city, on a Thursday, and is well supplied with home manufactures. There is another for the sale of horses, camels, mules, horned cattle, sheep, and other animals. The city is supplied with water by fountains, some of which exhibit traces of delicate sculpture. There are several tan-yards, one of which was said to employ fifteen hundred persons.

The Millah, or Jewish Quarter, which is situated at the south extremity of the city, is a walled enclosure, of about a mile and a half in circumference. It is populous, but, as usual, filthy in the extreme. All the Jews pay a capitation tax to the sultan, and are treated with the greatest contempt. Mr Washington was offered for sale, by the scheikh of the Jews and a rabbi, the only copy of the New Testament in Hebrew and Spanish, the last relic of the Spanish hospicio which once existed within the walls of the imperial city. Mahommedanism, in all its withering influence, reigns undisturbed. The Jews exercise several arts and professions, being the only goldsmiths, tinmen, and tailors, in Morocco. The Moors are the shoemakers, carpenters, masons, smiths, and weavers of haicks. With regard to the number of inhabitants in this city, travellers are much at variance. Jackson, with his usual liberality, assigns it 270,000; whilst Ali Bey (Don Juan Badia) in 1804 fixed the population at 30,000, a number doubted by other individuals. This extraordinary disagreement must be accounted for from the plague and other terrible visitations occasionally sweeping off thousands of inhabitants in a very short time. Mr Washington says that

Morocco. the population cannot exceed one hundred thousand, and is perhaps not above eighty thousand, including five thousand Jews. As the women rarely show themselves in the streets, it is difficult to estimate the number with any degree of exactness. The city, however, exhibits unequivocal tokens of having once had a far greater population. The dreadful plague, and more dreadful famine, which visited this country a few years since, committed fearful ravages. Not half the space within the gates is now inhabited; ruined walls and tenantless houses meet one at every turn; nothing flourishes but vegetation, which, even in the months of December and January, is rife and luxuriant, its springing freshness forming a striking contrast to the mouldering walls around.

The remains of numerous subterranean aqueducts surround the town. Some of these are ten or twelve feet in depth, and stretch across the plain to the foot of the Atlas. They are chiefly in ruins, and consequently out of use. This is the strongest evidence which can be produced in support of the fact, that the population of this country was far greater formerly than it is at present; and also that the arts were then more cultivated than they are now. A want of water is never hinted at by any traveller who has visited the imperial city; so that the few aqueducts which remain entire being sufficient for the supply of the present inhabitants, we are naturally led to conclude that those which have now fallen into disuse once conveyed a sufficiency of this indispensable element to a more abundant population, as well as to the grounds laid out in gardens in the vicinity of the city. Cemeteries also extend beyond the walls, both north and south; and there is one to the east of very considerable dimensions. This city was formerly surrounded with gardens and plantations extending to a great distance, but they have now for the most part disappeared. A few, however, still remain, and the sultan has three of about fifteen acres in extent within the city, and two of about twenty acres each, two miles distant from the walls. Every variety of fruit-tree enriches these gardens, olive, orange, pomegranate, citron, mulberry, walnut, peach, apple, pear, vine, fig, date, apricot, and the like; whilst trees of beautiful texture or foliage, the cedar, poplar, accacia, the solemn cypress, and the stately palm, together with a profusion of flowers and flowering shrubs, form a picturesque scene where the unchecked luxuriance and beautiful wildness of nature add a charm to the studied elegancies of the more regular ornaments of art. The grounds are well supplied with water by means of the conduits already mentioned.

The city of Morocco was built about the middle of the eleventh century, by Yousef Abu Tashfin, and at first obtained the name of Marakash. In the following century it reached its highest degree of prosperity; but there is little in its history except what belongs to the country generally, and as such will afterwards be given.

A few towns of Morocco, not yet mentioned, require some notice, and amongst these Mequinez has claims to precedence, as being the first city in the empire after Morocco and Fez. It is situated in a beautiful valley about sixty miles inland from Sallee, in lat. 33. 58. 30. E., and long. 5. 30. 0. N. It owes its importance to the policy of Sultan Muley Ismael, who, after conquering the various small kingdoms which now constitute the empire, for the purpose of strengthening the northern division, erected a walled town capable of containing a large garrison. There was formerly a Spanish hospitium here, as well as at Morocco; but it has long been deserted by the monks. At the south end of the city stands the palace, which forms an immense quadrangle enclosing a number of gardens well watered by streams from the adjacent country. In the centre of this enclosure is the harem, which again surrounds a small piece of ground planted with trees, and invested by a gallery supported on massive columns. This royal residence (the sultan occasionally inhabits it) is rendered more spacious by being constructed entirely upon the ground floor. The rooms, as usual, are narrow, but long and high; and the walls are inlaid with glazed tiles of bright colours. Many of the Jews here are affluent; and the inhabitants are described as more courteous and hospitable than those belonging to any other part of the empire. The population is estimated by Mr Jackson at 110,000 souls, but this is very probably an exaggeration. Ali Bey states, that the surrounding country, which, at a distance, appears to be a level plain, is in reality composed of a labyrinth of round hills, between which several small streams wind in innumerable sinuosities. The soil is sandy, with little clay, and produces nothing but palms and olives. Morocco.

Mr Washington, in his return from the imperial city, passed some interesting ruins. From the banks of the Oom-erbegh to the sea-coast at Tidallah, a distance of seventy miles, the country consists of a series of plains, at first gravelly and desert-like, but latterly of a fine rich soil, though little cultivated, and but thinly peopled. At twenty miles north of the Oom-erbegh, he stopped at a place called Kaisar, and both name and tradition agree in pointing out this spot as of high antiquity. Our traveller traced the foundation of a building, the north side of which was two hundred and fifty paces long, with towers at the corners, and walls of unhewn limestone five feet thick, but level with the ground. Other foundations of great extent were also visible, with a well and conduits leading to a spring; and the plain seemed admirably adapted for corn. These circumstances, together with the existence of several tumuli at some distance, have led travellers to conclude that this has been a Mauritanian or Roman station. Twelve miles to the north of this spot, the peasants have a tradition, that here a city, called Caria, had sunk into the ground; that many substantially-built wells were in the neighbourhood; that coins had been found (which they described as of *brass*), of the size of a Spanish dollar, and with an inscription of straight sticks and dots. Can this be other than the Roman denarius.

It remains for us shortly to describe the most southerly part of the empire, the province or kingdom of Suz or Suse. Agadeer or Agadir, better known under the Portuguese name of Santa Cruz, the last port in proceeding southward in the emperor's dominions, is situated in lat. 30. 35. N. Its bay, Mr Jackson says, is probably the best roadstead for shipping in the empire, being large, deep, and well defended on every side from all winds. The town stands upon an elevated position, and it is of great natural strength, besides being defended by walls and batteries. It was fortified in 1503 by Emanuel, king of Portugal, but taken by the Moors about thirty years afterwards; and continuing in the possession of these last, it might have attained to considerable importance, had not the refractory conduct of one of its governors provoked the emperor in 1773 to dismantle it, and transfer its commercial privileges to Mogadore. Forty-four miles eastward from Santa Cruz stands Tarudant, formerly the capital of a petty kingdom, and still the principal town in the province. It is situated on a fine but uncultivated plain about twenty miles south of the Atlas range. The walls, now half in ruins, enclose an area much larger than is occupied by the buildings, which are scattered about without any regularity. It still, however, possesses a noble palace, adorned with gardens containing the most delicious fruits; but, generally speaking, it has lost its trade, its population, and the consequence which once belonged to it as a provincial capital. Its reputation is now confined to the manufacture of a superior kind of saltpetre, and the preparation of leather used for saddles. The other places included in the province of Suz are too small to require mention.

Morocco. Our knowledge of Tafilet, the eastern province or kingdom, is rather limited, although the communications with the country, the ancient Sugulmessa, are very important. It is a flat plain, and the portion of the soil which is not sheltered by trees is bare sand. Comparatively little corn is grown; and what is produced is sown by the bank of a swelling river, one of the largest in the empire. Its name implies the gullet, being conferred on it from its forcing its way through a narrow rocky pass during a part of its course. The melting of the Atlas snows causes an annual overflow, which, as it never rains here, is of as much importance to the country as the inundation of the Nile is to Egypt; and the natives accordingly celebrate the event by festivities and public rejoicings. The people of Tafilet inhabit fortified towns, consisting of about four hundred families each, and subsist chiefly on dates, for which their country is much celebrated, and the milk of their camels. Deer and ostriches are numerous. The cities of Morocco and Fez are both entrepôts of Tafilet. The capital city, which bears the same name, is, by the route of the caravans, twenty days' journey from Morocco, across Mount Atlas, and four hundred miles from the foot of the mountain. When trade has reached Tafilet, there is a further transport to the utmost point in the interior, where is the grand mart; and during this journey the most cruel privations are endured, chiefly arising from the want of water. Tafilet, besides its intercourse in that direction, sends tobacco and dates to Guinea in exchange for gold dust. Salt is the chief article which this city receives from Morocco, and the trade in it is in the hands of the sultan, a proof of its importance. These caravans are always commanded and attended by Moors of distinction; they take with them blankets of the manufacture of Fez, tobacco, and salt; their great return is in young slaves.

The inhabitants of the empire of Morocco may be divided into six classes; namely, Moors, Arabs, Shelluhs, Berebbers, Jews, and Negroes.

The *Moors* are the descendants of those who were expelled from Spain when the Moorish dynasty was extinguished in that country. They chiefly inhabit the towns, and may be considered as the aristocracy of the country; filling the high offices of government, and forming the military. Their language is the Mogreb, or occidental Arabic, intermingled with Spanish. For a more particular account of the Moors, see the article BARBARY STATES.

The *Arabs* came originally from the desert, and, spreading themselves over the plains, there pitched their tents, commonly in a circle, hence called *douars*, and followed a pastoral life. When the soil is unproductive, the herbage scanty, or their tents become overrun with insects, so as to be no longer habitable, they emigrate to another place, a spring or a saint's tomb generally influencing the selection. They are mostly under the middle size, and slightly formed, but are a hardy race, and capable of great endurance. They are hospitable, and may be trusted under a promise, but are otherwise much given to thieving. Their language is the Koreish, or Arabic of the Koran, but greatly corrupted.

The *Berebbers* and *Shelluhs* inhabit the mountain range of Atlas; the former occupying the north-eastern part as far as the province of Tedla, and the latter the space extending from thence to the south-west. They live chiefly in villages, consisting of houses built of stones and mud, with slated roofs; but occasionally they live in tents, and even in caves. Their principal occupation consists in hunting; but they also cultivate the ground, and rear many bees. From their mode of life, they are more robust and active than their neighbours of the plains. It has been conjectured that they are the aborigines of this country, and the direct descendants of Ham, having been driven to the mountains by the incursions of the Arabs and Moors. Their language bears no affinity to the Arabic, although the latter tongue is partially intermixed with it. It has long been a disputed point whether the Shelluh and Berebber are the same language. Jackson declares they are not; but later writers are of a different opinion, holding them to be dialects of the same parent stock. Morocco.

The *Jews* in Morocco, as in most other countries, are a degraded race, despised and insulted by the Moors, whom they cheat in turn upon all occasions, and not only abused and struck by adults, but stoned by children for the slightest real or imaginary offence. They have no redress against these grievances; and they must also submit to undertake the most menial offices, such as those of servants, porters, and scavengers. They are likewise the chief mechanics, interpreters, and the like; and, besides being an exceedingly serviceable, are a very numerous body.

The *Negroes* are slaves, and a marketable commodity; but, from their high character for fidelity, they sometimes reach stations of great importance, and obtain their freedom. They constitute the sultan's body guard, and the only standing army in Morocco.

The government of this country is absolute, unmitigated despotism. The sultan is the head of both church and state, which are inseparable. The laws are the edicts of the despot, who in the capital administers justice in person. In the provinces, his authority is delegated to the *kalifa* or pasha, who faithfully copies the imperial despotism; yet judgment is generally correct, and always prompt. The leading principle of legislation appears to be, Keep the people poor, and they will not rebel. The religion of Morocco is Mahommedanism, and in performing their religious duties, such as prescribed prayers, ablutions, and the like, the Moors are very attentive, even when travelling. They look upon Christians as having no religion at all; and, perhaps, from the specimens they often meet with, they are not far wrong in this opinion.

The revenue is derived from taxes paid in kind, one tenth of corn and one twentieth of cattle. There is a capitation tax on all Jews; and districts where crimes have been committed are subjected to fines. But the revenue is uncertain, and government is frequently compelled to levy it by force from some of the Arab tribes. The whole may amount to about one million sterling. The military are a species of militia, who are called out when required. They receive no pay, but are furnished with a horse; and when those of the provinces visit the capital, they receive a trifling present. The only standing army is the sultan's body guard, which is about five thousand strong. All the soldiers carry long muskets, in the use of which they are very dexterous, firing at full gallop; and many of them are good marksmen. They are accustomed to sleep on the ground, without any covering, even in cold nights, which renders them hardy; but they are by no means formidable, as they have not an idea of the advantage to be derived from moving in regular bodies. If their first charge is indecisive, they are easily put to flight. They have no artillery for the field, its management under such circumstances being beyond their comprehension.

The education of the youth is confined to learning the Koran, which they commit to memory in the schools, with the management of a horse, and the use of fire-arms. Music is almost unknown in the country, a rude pipe, and still more barbarous drum, being their only instruments. These are made to sound without any pretensions to concord; but amongst the Shelluh mountaineers, whose songs are plaintive and pleasing, the charms of harmony are not unknown.

The usual food throughout the country is a dish called *Kuscasu*, which consists of mutton and fowls stewed with a few vegetables, and served up in a large earthenware

Morocco. pan, filled to overflowing with granulated paste, forming a savoury and nutritious dish. This is placed on the ground, and around it half a dozen of persons sit down cross-legged. Chairs, tables, knives, forks, spoons, and plates, are superfluities unknown to the Moors. Coffee is not used, but tea is very generally so, and presented to visitors at all hours of the day. The Moors do not smoke tobacco, but snuff is taken in great quantities. They occasionally smoke the leaves of the hemp plant, which partakes of the soothing qualities of opium. A sort of confection of the seed of this plant, called *keef*, has the same properties, and the use of this article is consequently much resorted to.

The trade of Morocco is not at all commensurate with its size, or the number of its inhabitants. The only manufacture is that of the leather which bears its name. The other exports consist of sweet and bitter almonds, gum-barbary, gum-soudan, gum-sandrac, bees' wax, goat-skins, oil of olives, sheeps' wool, ostrich-feathers, elephants' teeth, pomegranates, raisins, worm-seed, rose-leaves, glue, fennel, walnuts, cummin seeds, lead ore, capers, carraway seeds, and similar productions. The articles of import which meet the readiest market are cloths of various fabrics, cambrics, muslins, blue linens, striped silk, velvets, damask, sugars and spices of all kinds, tea, gums of sundry descriptions, iron, wrought pewter, tin, white-lead, copper in sheets, mirrors, earthenware, paper, coral beeds, Brazil wood, and Mexican dollars. Besides the commercial transactions now mentioned, Morocco maintains a constant intercourse with the negro nations beyond the Sahara, whence are brought gold dust, ivory, and gums, more especially that valuable sort which is known by the name of gum Senegal, or Soudan. The principal inlet to European produce is the port of Mogadore, where accounts are kept. The circulating medium consists of nutkeels of ten ounces, the ounce being divided into four olankeels, and the olankeel into twenty-four fluce. From their proportion to the Spanish dollars, the olankeel may be valued at one penny, the ounce at four pence, and the nutkeel or ducat at three shillings and four pence. The weights and measures are as follow: The commercial pound is generally regulated by the weight of twenty Spanish dollars; so that one hundred pounds Mogadore weight, or the quintal, is equal to one hundred and nineteen pounds avoirdupois. The market pound for provisions is fifty per cent. heavier, or one pound twelve ounces and a half avoirdupois. The corn measures are for the most part similar to those of Spain, but there are considerable discrepancies. The cubit or canna, which is equal to twenty-one English inches, is the principal long measure. Various estimates have been given of the annual value of the exports and imports to and from Morocco, on the loosest authority. Morocco.

Having completed the general description of this country, we shall now subjoin the following official returns, collected by his majesty's consuls.

Statement of the Trade of the Empire of Morocco, showing the Number and Tonnage of Vessels employed therein, with the Countries to which they belonged; also, the Value of Imports and Exports, distinguishing the Amount of British and Foreign Goods Imported, and the Trade carried on in British and Foreign Vessels at each Port of the Empire, in the Year 1835.

PORTS.	VESSELS EMPLOYED IN TRADE.		IMPORTS.				EXPORTS.
	No.	Tonnage.	Bullion. (Dollars.)	British Goods.	Foreign Goods.	Total.	Produce of Morocco.
			£	£	£	£	£
Mogadore	57	7,562	31,406	57,157	43,221	131,884	167,920
Saffee	5	510	...	...	...	...	2,184
Mazagau	31	4,588	17,884	6,855	...	24,739	33,560
Rabatt	19	1,591	...	22,985	2,442	25,427	22,068
Laraiche	27	2,006	...	8,492	46	8,538	6,767
Tangier	191	7,467	...	28,106	3,362	31,468	37,409
Tetuan	81	6,330	...	37,754	4,441	42,195	42,502
Total	411	30,054	49,290	161,349	53,612	264,251	312,410
ABSTRACT.							
British[1]	163	10,416	4,892	118,909	10, 450	134,251	125,546
Austrian	10						
French	12						
Neapolitan	2						
Portuguese	21						
Russian	2						
Sardinian	71	19,638	44,398	42,440	43,162	130,000	186,864
Spanish	106						
Swedish	2						
Tuscan	14						
American	8						
Total	411	30,054	49,290	161,349	53,612	264,251	312,410

[1] Besides the above number of British merchantmen. there entered at Tangier fourteen British vessels of war, and five yachts, and at Tetuan four vessels of war.

Morocco.

Statement of the Quantities of British and Colonial Merchandise Imported into the Empire of Morocco in the Year 1835.

Morocco.

	Quantities.	Value. £		Quantities.	Value. £
Alum	35 tons,	525		Brought forward,	125,426
Arsenic	6 boxes,	50	Hardware of all sorts:		
Cassia	62 cases,	98	iron, brass, &c.	320 casks,	8,574
China	46 boxes,	315	Iron bars	808 tons,	8,888
Cloth, coarse	97 bales,	6,790	Lead, red	181 casks,	1,079
... fine	13 ...	1,470	Linen	7 bales,	360
Coffee	181 bags,	543	Logwood	445 pieces,	120
Cotton goods, brown	286 bales,	8,550	Pepper, black	145 bags,	302
... India	60,990 pieces,	64,039	Silk manufactures of India, Bandanoes, &c.	23 bales,	1,750
... wares	1,134 boxes,	38,556	Steel	343 casks,	707
... thread	48 bales,	960	Sugar, refined	3,970 cwts.	9,924
Earthenware	196 crates,	905	Tea, Hyson	94 large boxes,	1,800
Ginger	142 bags,	210	... common	484 ...	2,420
Gum Benzoin	75 boxes,	600			
Gunpowder	363 kegs,	1,815			
	Carry forward,	£125,426	Total		£161,350

Statement of the Quantities and Value of the Produce of the Empire of Morocco Exported from the Principal Ports of that Country to Great Britain, including her Dependencies, and to all other Countries, in the Year 1835.

ARTICLES.	To Great Britain and her Colonies.		To other Countries.		Total.	
	Quantities.	Value.	Quantities.	Value.	Quantities.	Value.
		£		£		£
Almonds, sweet ..... cwts.	4,976	14,585	1,040	3,072	6,016	17,657
... bitter	2,390	7,006	244	715	2,634	7,721
Barley ..... fanegas	6,488	1,340	2,500	502	8,988	1,842
Dates ..... cwts.	125	377	82	258	207	635
Elephants' teeth	25	558	...	...	25	558
Feathers, ostrich	14	1,131	...	...	14	1,131
Fowls ..... doz.	2,000	1,000	...	...	2,000	1,000
Gum Arabic ..... cwts.	4,504	14,133	560	1,759	5,064	15,892
... Morocco	1,372	4,315	20	126	1,392	4,441
... Sandarach	482	2,575	142	743	624	3,318
... Senegal	184	1,637	...	...	184	1,637
Oil	5,530	8,105	880	1,290	6,410	9,395
Orchilla	56	293	12	63	68	356
Oxen, live ..... No.	1,415	5,925	...	...	1,415	5,925
Skins, goat ..... doz.	6,640	4,518	50,655	35,375	57,295	39,893
... calf ..... cwts.	1,480	3,099	1,582	3,312	3,062	6,411
... sheep	4,830	8,090	8,730	14,623	13,560	22,713
Saltpetre	104	109	1,117	1,221	1,221	1,330
Wax	1,524	10,201	3,846	24,158	5,370	34,359
Wheat ..... fanegas	10,681	3,141	1,759	523	12,440	3,664
Wool ..... cwts.	16,390	34,317	46,671	98,974	63,061	133,291
Drugs, &c	.....	92	...	152	...	244
Total	.....	125,546	...	186,864	...	312,410

The empire of Morocco is a remnant of the great African monarchies founded by the Saracens. The dynasty of the Aglabites, whose seat of empire was at first Kairwan, and that of the Edrisites, whose capital was Fez, were both subjugated by the Fatimites, who, finding employment for their arms in conquering Egypt, allowed their western dominions to be usurped by the variously-named Zuhites. These again were supplanted by the Moravedi or Morabeth, who rose into military consequence about the middle of the eleventh century. Their chief, Abu Bekr Ben Omar Lamathouni, with an army of Marabouts, made himself master of the country, after which he assumed the title of Emir al Mumenim, or Prince of the Faithful. His successor, Yussuf Abu Tashfin, pushed on his conquests, carrying his arms into Spain; and to this prince is ascribed the building of the city of Morocco, which at first obtained the name of Marakash. In the middle of the twelfth century this warlike people gave way before the Almohades, a sect or tribe of more austere character, and supposed to be *Kabyles* of the Berber nation. This tribe subjugated a considerable portion of Africa, but were not so fortunate in Spain as their predecessors. After the lapse of a century, intestine discords exposed the Mohadi to the successful attacks of several rival tribes, particularly the Merinites, or Beni Merini, who ultimately obtained possession of the kingdoms of Fez and Morocco. This tribe, however, did

Morpeth ‖ Morpheus.

not push its conquests far, and its power was shaken by hordes of unknown name and origin, who continued to issue from the eastern desert. It was ultimately overthrown by the Oatazi, an obscure race, who envied the greatness of the Beni Merini, and aspired to supreme dominion. Coincident with the triumph of the Oatazi was the invasion of the Portuguese, who established themselves along the coast, and began to disturb the country with a view to the propagation of Christianity. This emergency in their affairs induced the Oatazi to call to their aid the Shereefs settled at Tafilet. In fact, they appear to have been invited on account of their character as the supposed descendants of Mahommed, under the emergencies of the state, menaced with extraneous violence. Hassan Shereef had the merit. in the eyes of his country, of delivering it from the dangers of foreign thraldom; and he compensated himself by the possession of the sceptre, which he left to his family. He was completely successful in his enterprise; and having subjugated the zealots, who had shaken the empire, he placed on the throne that dynasty which continues to occupy it to the present day. With the regal power the descendants of Hassan unite the more sacred distinction which attaches to their pedigree as the progeny of Mahommed.

Morrhina Vasa ‖ Mortain.

Mr Washington, the only traveller who can be fully relied on, estimates the actual population of Morocco at between five and six millions. (R. R. R.)

MORPETH, a town in the county of Northumberland. in the western division of the ward of its own name, 292 miles from London, situated on the banks of the river Wensbech, in the course of the great road from London to Edinburgh. The town can boast of remote antiquity, and is well built, consisting chiefly of two wide streets, in the centre of which is the market-place, which, though conveniently situated, is not sufficiently capacious for the large droves of cattle which are here exposed for sale. From the year 1553 till 1832 the town returned two members to parliament, elected by the bailiffs and free burgesses; but since the passing of the reform bill it returns only one. Before 1832 the number of voters was estimated at about 200; at the last general election (1835) there were 336 electors registered as qualified to vote. By the late municipal corporations bill, the borough is placed under the municipal government of four aldermen and twelve councillors. Morpeth has been twice destroyed by fire, first in 1215, on which occasion, Camden says, it was burned down by its inhabitants, out of hatred to King John; but the chronicle of Melrose assigns a more probable cause, asserting that this and many other towns were destroyed by the barons, with the view of distressing that monarch on his march to punish their revolt. It was burned down a second time by accident in 1689, when nearly the whole buildings were destroyed. Besides the parish church (a very plain structure), there is a Catholic chapel, and a Presbyterian and a Methodist meeting-house, in the town. Edward VI. founded and endowed a grammar school here: there is likewise an English free school. In 1829 there was erected a new county jail, house of correction, court-house, &c. The town-house was erected at the expense of the Earl of Carlisle, in 1714. Of Morpeth Castle, which was situated on an eminence in the neighbourhood, few vestiges remain. It was built by William Lord Greystock in 1358, and is said to have been of some extent and consequence as a baronial mansion. The population of the town amounted in 1801 to 2951, in 1811 to 3244, in 1821 to 3415, and in 1831 to 3890; but the whole parish, which contains seven other townships, appears by the last census to have had 4797 inhabitants. In the borough of Morpeth there are 560 inhabited houses, 897 families, fifty-five of whom are chiefly employed in agriculture, 353 in trade, manufactures, and handicraft, and 489 not comprised in either of these classes: the males amounted to 1851, and the females to 2039.

MORPHEUS, in fabulous history, the god of sleep, or, according to others, one of the ministers of Somnus. He caused drowsiness, and represented the forms of dreams. Ovid styles him the kindest of the deities; and he is usually described in a recumbent posture, crowned with poppies.

MORRHINA or Murrhina Vasa, were a sort of cups or vases made use of by the ancients. Authors are not agreed as to the substance of which they were made. Some say they were of stone; others assert that they were made of a fluid condensed by being buried under ground. All that we know concerning the matter is, that this kind of cup was known by the name of *murrha*, and that Heliogabalus's chamber-pot was made of it. The word is sometimes written *myrrhina*.

MORRISE-Dances. See Morresque-Dances.

MORS, Death, one of the infernal deities, born of Night without a father, and worshipped by the ancients with great solemnity. Death was not represented as an actually existing power, but as an imaginary being; and Euripides, in one of his tragedies, introduces this deity upon the stage. The moderns represent death as a skeleton armed with a scythe and a scimitar.

MORSHANST, a circle of the Russian province of Tambow, extending from east longitude 41. 17. to 43. 27., and from north latitude 53. 14. to 53. 55.; containing 1958 square miles, with 104,870 inhabitants. The soil is good, and produces a surplus of corn and cattle, and a sufficiency of wood. The capital is the city of the same name, situated on the river Zna, 828 miles from St Petersburg. It contains 609 houses, with 5500 inhabitants, who find employment in making sail-cloth, twine, ropes, and in melting tallow. Long. 41. 55. E. Lat. 53. 25. N.

MORTAGNE, an arrondissement of the department of the Orne, in France, extending over 766 square miles, and containing a population of 126,267 persons. It is divided into eleven cantons, and these again into 155 communes. The capital is the city of the same name, situated on a hill, at the base of which flows the river Chyppe. It is a well-built town, surrounded with walls, and in the year 1836 contained 5692 inhabitants, who make some linen and cotton goods, and carry on some twist spinning. Long. 0. 27. 14. E. Lat. 48. 31. 18. N.

MORTAIN, an arrondissement in the department of La Manche, in France, extending over 326 square miles, and containing a population of 74,241 persons. It is divided into eight cantons, and these into seventy-three communes. The capital is the town of the same name, situated on the river Cance, between two steep rocks. The inhabitants amount to 2521 persons, who are employed in making earthenware, and the females in making thread lace. Long. 1. 7. W. Lat. 48. 57. N.

MORTALITY, HUMAN.

Mortality, Bills of.

We shall consider this very important, as well as curious subject, under two distinct heads; the first of which will treat of the History and Formation of Bills of Mortality; the second, of the Law of Mortality.

I. MORTALITY, BILLS OF.

Bills of Mortality are abstracts from parish registers, shewing, as their name imports, the numbers that have died in any parish or place during certain periods of time, as in each week, month, or year; and are, accordingly, denominated weekly, monthly, or yearly bills. They also include the numbers of the baptisms during the same periods, and generally those of the marriages.

Objects of this article.

The objects of the present article are these:—First, to give a brief history of the principal things that have been done in this way, which may suffice for such as are not disposed to go further into the subject, and may, at the same time, indicate the best sources of information to those who take more interest in it.

As both mortuary registers and enumerations of the people are much more valuable when combined than when separate, we shall also notice some of the principal enumerations, the results of which have been published. We shall then point out some of the principal defects in most of the published registers and enumerations; and, lastly, shall submit some forms, according to which, if enumerations be made, and registers kept, they will be easily convertible to useful purposes.

History.

The ancients do not appear to have kept any exact mortuary registers, at least no account of any registers of that kind, with the ages of the deceased, have come down to us; and although, in the Roman *Census*, first established by Servius Tullius, both the ages and sexes of the people were distinguished, we have no exact account of these particulars in any one of their enumerations.

Indeed the principal object of the *census* among that warlike people, was the levying of men and money for the purposes of conquest; the duration of human life appears to have occupied very little of their attention, and their proficiency in the science of quantity was not sufficient either to shew them what the necessary *data* were, or to enable them to draw just inferences from them, had they been in their possession.

A good account of what the ancient Romans did in this way, with references to the original authorities, may be found in the Italian translation of M. Demoivre's *Treatise of Annuities on Lives*, by Gaeta and Fontana, which was published at Milan, in the year 1776, in 8vo. (*Discorso Preliminare*, parte 2).

The keeping of parish registers commenced in England in the year 1538, in consequence of an injunction issued in that year by Thomas Cromwell, who, after the abolition of the Pope's authority in this kingdom, in the reign of Henry VIII., had been appointed the king's vicegerent in ecclesiastical affairs.

Some parish registers in Germany appear to have commenced with the sixteenth century; and in the *Göttliche Ordnung* of Süssmilch (t. iii. s. 23), we are informed, that at the time of Lord Cromwell's injunction, they had already old registers of that kind both at Augsburgh and Breslaw. However, the extracts there given from the Augsburgh registers do not go back further than the year 1501, nor those for Breslaw beyond 1555. About the beginning of the seventeenth century, such registers appear to have been established in most parts of Europe; but it was not until the year 1662 that they began to attract public notice, and to be considered as the sources of valuable and interesting information.

Mortality, Bills of.

Mr. Graunt

In that year, John Graunt, a citizen of London, (afterwards an officer in the trained bands of the city, and a Fellow of the Royal Society), published his *Natural and Political Observations on the Bills of Mortality*, principally those for London. The London bills, or accounts of baptisms and burials, appear to have been occasioned by the plague, and to have been begun in the year 1592, a time of great mortality. They were afterwards discontinued, but were resumed in 1603, after the great plague of that year. They have ever since been continued weekly, and an annual bill also has been regularly published. In 1629, the number of deaths by the different diseases and casualties, were first inserted in them, also the distinction of the sexes; and these have been continued ever since. But it is in the totals only of the baptisms and burials that the sexes are distinguished in these bills. They do not shew how many of each sex died of each disease, neither have they, since 1728, when the distinction of the ages of the dead was first introduced, shewn how many of each sex died in each interval of age, but only the total number of both sexes.

This book of Graunt's, although the first, is also one of the best that have been published on the subject. It contains many judicious observations on the imperfections of the bills, on the proportions of the deaths from different diseases and casualties, and on their increase and decrease, with the probable causes of such fluctuations. He also observed, that "the more sickly the years are, the less fecund or fruitful of children also they be."

Besides the London bills, he gave one for a country parish in Hampshire, in the first edition of his book; and, in an appendix to the later editions, two others, one for Tiverton, the other for Cranbrook in Kent, with a few observations on foreign bills. He almost always reasons justly from his *data*; but, as these were very imperfect, in his endeavours to draw more information from them than they could supply, he has sometimes fallen into error.

Even in this enlightened age, when a much greater proportion of the people devote a portion of their leisure to the acquisition of knowledge than in Graunt's time, subjects of this kind have but few attractions for the generality even of reading men, who cannot endure the fatigue of thinking closely for any length of time. The author, accordingly, expected his readers to be rather select than numerous, and was ambitious of that distinction, as appears by the motto he prefixed to his work,

> ——Non, me ut miretur turba, laboro,
> Contentus paucis lectoribus.

The book was, however, favourably received by the public, and went through five editions in fifteen years, the two first in 4to, the three others in 8vo; the last of them, published in 1676, two years after the author's death, was edited by his friend Sir William Petty, who, in consequence of having sometimes spoken of this edition as his own, has by some writers been erroneously considered as the author.

Graunt's observations, like all others of a similar kind, by shewing the usefulness of parish registers and bills of mortality, contributed to form a taste for these inquiries amongst thinking men; and, consequently, to improve both the registers and the bills derived from them; so that, from his time, the subject has been continually cultivated more and more. Parish registers, in most parts of Europe, have been kept with more care; and a succession of works of considerable merit have been published on the subject, containing an

Mortality, Bills of.

important part of the natural and political history of our species, and affording valuable materials for the science of political economy.

The principal of these works we shall proceed to give a short account of, in the order of their publication.

As the ages at which the deaths took place were not inserted in the London bills till 1728, Captain Graunt could not avail himself of that important information, but made a fruitless attempt to determine the law of mortality without it.

Dr. Halley.

The Breslau bills appear to have been the first wherein the ages at which the deaths took place were inserted, and the most important information which bills of mortality can afford was first drawn from them by Dr. Halley; who, in 1692, constructed a table of mortality for Breslau from these bills for the five preceding years, and inserted a paper on the subject in the *Philosophical Transactions*, (No. 196.)

Dr. Davenant and Gregory King.

In 1699, Dr. Davenant, in *An Essay upon the probable Methods of making a People Gainers in the Ballance of Trade*, published some extracts from *Natural and Political Observations and Conclusions upon the State and Condition of England*, by permission of their author, Mr. Gregory King, Lancaster herald, who had completed them in 1696, though they still remained in manuscript; and the whole of this very curious production was published by Mr. Chalmers at the end of his *Estimate* in 1802. Mr. King derived his information from the poll-books; from actual observations in particular places; from the assessments on marriages, births, and burials; and from the parish registers. Many of his conclusions agree surprisingly well, considering the time he wrote, with those which are the results of a hundred years of further observations and inquiries. He had access to much better *data* than Graunt, and his conclusions are more accurate; but he does not explain so fully how he arrived at them.

Chalmers.

M. Kersseboom.

From the publication of Davenant's essay, above mentioned, nearly forty years had elapsed without any thing further being done in this way, when M. Kersseboom published an essay, in the Dutch language, on the probable number of people in Holland and West Friesland, which he deduced from the Bills of Mortality, Hague, 1738, 4to; and two others in 1740 and 1742. (See Law of Human Mortality.)

J. P. Süssmilch.

In 1742 was published the first edition of the celebrated work, entitled *Die Göttliche Ordnung in den Veränderungen des menschlichen Geschlechts aus der Geburt, dem Tode und der Fortpflanzung desselben erwiesen von* Johann Peter Süssmilch. The second edition appeared in 1761, enriched with the materials which had been laid before the public through various channels in the interim; the third in 1765, and in 1775 a fourth edition of the two volumes of

J Baumann

Süssmilch was published by Christian Jacob Baumann, to which this editor himself added, in 1776, a third volume, consisting of additions to the other two, and remarks upon them, with many new tables, and a copious index. The last edition of this work was published in 1798, but it does not appear to have been augmented or improved since 1776. It contains long dissertations on every thing not mathematical connected with the subject, and, besides original information, includes the substance of all the other publications on it previous to 1776; with an immense collection of materials, which, when borrowed, are often better arranged and rendered more convenient for reference, than they will be found to be in the works they were extracted from; besides, the original sources of information are always referred to, and these advantages, with that of a full index, render it a valuable work for occasional reference. The three thick octavo volumes contain upwards of two thousand three hundred pages, closely printed with a small type, and the tables alone occupy three hundred and thirty pages.

M. Deparcieux.

In 1746 was published the *Essai* of M. Deparcieux, which has been already mentioned in the historical introduction to the article Annuities. Information much wanted on this subject, was there given in a very clear and popular manner, and the work no doubt contributed greatly to the advancement of the science. It probably had some influence in promoting the establishment of what is called the *Tabellverket* in Sweden, which took place in 1749, and of which we shall have occasion to take further notice presently.

Mortality, Bills of.

In 1750 appeared, in octavo, *New Observations natural, moral, civil, political, and medical, on City, Town, and Country Bills of Mortality; to which are added, large and clear Abstracts of the best Authors who have written on that subject; with an Appendix of the Weather and Meteors*, by Thomas Short, M.D. which he had "had on the anvil" for eighteen years, as he informs us in the preface to his *History of Air, Weather*, &c. This author, with incredible labour, collected extracts from the motuary and baptismal registers in a great many market-towns and country parishes in England, chiefly in the northern counties, in almost every variety of soil and situation, and reduced them into tables in various ways, so as to enable him to draw useful inferences from them.

Dr. Short.

He informs us that Lord Cromwell's injunction in 1538 was but little regarded in many places till the year 1559, when another was issued for the same purpose by Queen Elizabeth; nevertheless, he had procured several exact country registers, commencing with 1538, and continued without one chasm, for more than two hundred years; and the registers before 1644, he considered to be much more valuable than afterwards, on account of the increase of dissenters from that time. He likewise procured both the numbers of families and of souls in seven of the market towns, and fifty-four of the country parishes, for which he had registers; and thus arrived at satisfactory information on several points, which, till then, had been very imperfectly understood. But the sexes were not distinguished in his enumerations; neither were the ages, in any of the enumerations or registers he has given accounts of, except in the London Bills of Mortality, and what he has taken from Dr. Halley, respecting those for Breslau.

Although Dr. Short took so much trouble in collecting materials, and has generally reasoned well upon them, he has shown but little skill, and does not appear to have taken much pains in communicating his information to his readers; so that it costs them considerable labour to find what they want, especially in his tables; and when found, to understand it.

Mr. Morris

In 1751 was first printed a tract by Corbyn Morris, entitled, *Observations on the past growth and present state of the City of London*, with the most convenient and instructive tables of the London bills that have been printed; they contained the annual baptisms and burials from the year 1603, the number of annual deaths by each disease from 1675, and of each age from 1728; all brought down to the year 1750. This tract was reprinted in 1758, with a continuation of the tables to the end of 1757; these also contain useful annual averages and proportions. Mr. Morris's observations are generally very judicious, but he was one of those authors who appear to have laboured under much misconception with regard to the evils to be apprehended from the mortality of London, and what they considered to be its baneful effects in drawing recruits from the country. These writers did not perceive, or did not sufficiently consider, that the natural procreative power is much more than adequate to supply any waste of that kind, and that the real obstacle to the increase of the people, is the limited means of subsistence. This had been observed by Dr. Halley in his *Further Considerations on the Breslau Bills of Mortality, (Phil. Trans.* 1693,) though it there also appears, that he had not sufficiently considered the mode of its operation: this was first fully illustrated by Dr. Franklin in his excellent *Observations on the Increase of Mankind, Peop-*

Mortality, Bills of.

ling of Countries, &c. written in Philadelphia in 1751, the same year in which Mr. Morris's pamphlet was first published. The author also pointed out in that pamphlet, material defects in the Bills of Mortality, and proposed a better method of keeping them, not only in London, but throughout the kingdom. This gave occasion to a paper by Mr. James Dodson, which was inserted in the *Philosophical Transactions* for that year (1751,) wherein he showed the importance of their being so kept as to afford the means of valuing annuities on lives, and proposed other alterations which appeared to him calculated to fit them for the purpose.

Mr. Dodson

Nicolaas Struyck.

Nicolaas Struyck of Amsterdam, who, in his *Introduction to General Geography*, published there in 1740, had inserted *(Gissingen over den staat van 't Menschelyk Geslagt,) Conjectures on the State of the Human Species;* published at the same place in 1753, a quarto volume, the first half of which is astronomical, the other (216 pages) is entitled *(Nader Ontdekkingen noopens den staat van het Menschelyk Geslagt,) Further Discoveries concerning the State of the Human Species.* It contains statements of actual enumerations of the people in many Dutch villages, principally in North Holland, wherein the sexes are distinguished, and the numbers in childhood, celibacy, marriage, and widowhood; but with respect to their ages, it is only stated for each sex, how many were under ten years, and how many of the unmarried were above that age; except in two instances, wherein the number of each sex is given in each interval of five years of age, from birth to the extremity of life: they amount altogether to 2728, of whom not one was above the age of eighty-five, and only four above eighty.

He generally gives, for each place, the names and professions or occupations of the persons who made the enumeration, and the precise day on which it was made; or if it occupied the parties more days than one, those on which it was commenced and completed are given; a practice which shows a laudable solicitude about particulars, and a title to our confidence, the want of which we have great cause to lament in too many other writers.

Extracts from many parish registers are also given; in these, too, the ages are seldom noticed; but in a few cases they are given very minutely, especially in that of Westzaandam, for which, the numbers who died in each interval of five years of age, from birth to the extremity of life, are given; also the number in each year of age under fifteen, the number in each month of the first year of age, even the number that died in the first hour from birth, in the first twenty-four hours, and in each day of the first week of their age. During a term of nineteen years, the whole number of deaths thus registered was 3328; but the sexes were not distinguished under fifteen years of age, which Struyck himself lamented. The work also contains much information respecting the population and parish registers of *Amsterdam*, *Haarlem*, &c. with some accounts of other countries, and of other works on the subject.

Dr. Birch.

In 1759 was published at London, in 4to, *A Collection of the yearly Bills of Mortality, from* 1657 *to* 1758 *inclusive, together with several other Bills of an earlier date;* to which were subjoined Captain Graunt's *Observations; Another Essay in Political Arithmetic*, by Sir William Petty; the *Observations of Corbyn Morris, Esq.;* and *A Comparative View of the Diseases and Ages, with a Table of the Probabilities of Life for the last thirty years*, by J. P. Esq. F. R. S. This is a valuable compilation, and has been generally attributed to Dr. Birch, the Secretary and Historian of the Royal Society; the preface is very judicious, and contains a good deal of information. For the following history of this publication, the author of the present article is indebted to the kindness of Dr. Heberden:—

"The bills were collected into a volume by his father, the late Dr. Heberden. He procured, likewise, observations from several of his friends, rectors of some large parishes, or others likely to give him information; particularly from Bishop Moss, Bishop Green, Bishop Squire, and Dr. Birch. These, together with some of his own remarks, were thrown into the form of a preface; and the whole was committed to the care of Dr. Birch. To make the calculations which appear at the end of the book, Dr. Heberden employed James Postlethwayt, Esq. a very distinguished arithmetician."

Mortality, Bills of.

In the year 1766, this branch of knowledge was enriched with new materials, of more value than all that had previously been laid before the public. These were contained in three publications, of which we shall first notice the *Recherches sur la Population des généralités d'Auvergne, de Lyon, de Rouen, et de quelques Provinces et Villes du Royame.* Par M. Messance, Receveur des Tailles de l'Election de Saint Etienne.

M. Messance.

Most of the political writers in France, for some years previous to the date of this publication, had asserted confidently that the kingdom was depopulated, but without producing any proofs. The object of M. Messance was, to enable his readers to judge of the merit of such assertions, and to pronounce less vaguely on a subject in itself so interesting, the knowledge of which can only be obtained by a great number of facts and actual observations. The work, accordingly, is filled with tables, exhibiting the results of actual enumerations of the people, and of extracts from the parish registers. They show, for each sex, how many were under fourteen, or in celibacy above that age; those in the states of marriage and of widowhood; and the number of domestic servants. The numbers of families are also stated; and the enumerations of the ecclesiastics, properly classed, are given separately; but no other information respecting the ages of the living is given than that mentioned above. A great many statements are also inserted of the numbers that died in different parishes and more extensive districts, under five years of age, between five and ten, and in each interval of ten years, from thence to the age of one hundred; during different periods of from ten to forty years or more, generally ending about the year 1760; but in these the sexes are not distinguished.

In all cases, he has given the general results of his tables, and the proportions they afford, very distinctly stated; and among these results, the increase of the population during the preceding sixty years, to which his researches were generally limited, is clearly ascertained.

The work also contains many interesting tables, in which the rate of mortality and the produce of manufacturing labour, are compared with the contemporaneous prices of grain, in various places, generally for periods of twenty years each.

M. Muret.

In the same year was published, at Yverdon, in octavo, the work entitled *Mémoire sur l'Etat de la Population, dans le Pays de Vaud, qui a obtenu la prix proposé par la Société Economique de Berne.* Par M. Muret, premier Pasteur à Vevey, et Secretaire de la Société Economique de Vevey.

The Pays de Vaud contains 112 parishes, and the population at that time was about 113,000 souls. M. Muret wrote for information to all the clergymen in the country, who made him returns of the numbers of baptisms and burials in their respective parishes, for different periods, from ten to forty years, in many of which both the ages and sexes were distinguished; and from about two-thirds of them he obtained also the numbers of marriages and families actually subsisting; also the number of souls, "or at least of communicants," in their parishes: but neither the ages nor sexes were distinguished in any of the enumerations of the living.

This performance does much credit both to the author's industry and judgment, but it has also material defects. He gave upwards of fifty tables, by which he intended to show the probabilities and expectations of life till five years of age, and at every fifth year after that, in different parishes

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and places, under various circumstances of soil and situation, and for people of different habits and occupations; also for the two sexes separately. These must have cost him a good deal of labour, and would have been extremely valuable had they been correct; but, unfortunately, he did not understand the construction of such tables, and they are not to be depended upon. He also took considerable pains to determine the rates of mortality among married and single women, considered separately, and thought he had proved that it was less among the married; but the proofs he adduced were not conclusive. Some of his observations on the state of the population, and the plans he recommended for encreasing it, also show, that he did not understand the principle on which its progress depends.

It is with much reluctance that we make, on so respectable an author, remarks which apply equally to almost all his predecessors in these inquiries; but this we consider to be rendered necessary, by the *Memoir* generally, and the Tables in particular, having been praised for their extreme accuracy, in a very good abridgment of them, inserted in the second volume of a book, entitled *De Re Rustica*, or the Repository, Lond. 1770, 8vo.

The disadvantages of her soil and climate necessarily keep Sweden thinly peopled in comparison with the countries which, in these respects, are more happily circumstanced; and since the year 1748, the state of the population has been an object of anxious solicitude with the government; which, in 1749, established what, in this country, would probably be called a Board of Population, but is there denominated *Tabell-Värket*, that is, *Table-Establishment*, for reducing into convenient forms the extracts from the parish registers, and the returns from the magistrates of the numbers of the people, which the governors of the different provinces are required to state to the commissioners appointed for these purposes. The extracts from the registers are made and transmitted annually, but the enumerations only once in three years.

Printed forms, with proper blanks, distinguishing the ages and sexes, both of the living and the dead, with the diseases the deaths were occasioned by, are distributed throughout the country, to enable the people to make these returns correctly and uniformly; and the information thus acquired, respecting the state of population and mortality, is much more correct and satisfactory than what has been obtained in any other place of considerable extent; but from causes which we have not room to explain here, the results were not laid before the public until some years after the returns were made.

M. Wargentin.

M. Wargentin who was one of the Royal Commissioners of the Tabell-Värket, inserted in the Transactions of the Royal Academy of Sciences at Stockholm for the years 1754 and 1755, six papers on the usefulness of annual registers of births and deaths in a country; which, like all his other productions, were written with much judgment and modesty; but, to illustrate the subject, he was generally under the necessity of borrowing materials from the writings of others; as, at that time, he was only in possession of the results of complete Swedish returns for the years 1749 and 1750. In the same Transactions for the year 1766, he inserted a paper on the mortality in Sweden, in which he gave Tables exhibiting the number of the Living of each six in each of the following intervals of age:—between birth and one year completed, between one and three, between three and five, and then in each consecutive period of five years of age till ninety, the last including all those above ninety years of age; at the three enumerations of the people which were made in the years 1757, 1760, and 1663; with the annual average number of still-born children and of those born alive, also the number of deaths that took place in each of those intervals of age, during each of the periods of three years, which ended at the times of these three enumerations, the sexes being always distinguished. These particulars he gave both for all Sweden and Finland, and for Stockholm separately; with other interesting results of the registers and enumerations, and many judicious observations on them. The ages of the living at the different enumerations, and those at which the deaths took place in all the subsequent publications of them, have been given for the intervals of age stated above.

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This paper of M. Wargentin is more valuable than all that had previously been published on the subject; it is also to be found in the French abridgment of the Stockholm *Transactions*, in the eleventh volume of the *Collection Académique (partie étrangère)*, which abridgment was also published separately in 4to at Paris, in 1772.

Condorcet in his *Eloge* of M. Wargentin states, that he had collected the results of his labours as Commissioner of the Tabell-Verket in a great work which he had not time to publish; but in that statement, there is probably some mistake. In the Stockholm Transactions for the first quarter of the year 1801, M. Nicander informs us, that M. Wargentin at his death, left in manuscript a continuation of the observations published in 1766, consisting of four statements similar to those just mentioned; the first for the years 1765, 1766, and 1767, the second for the two following years, the third for the year 1772 alone, and the fourth for 1774, 1775, and 1776; and having taken the mean of all the seven, he sent it a little before his death to Dr. Price, who published it in the fourth edition of his "*Observations on Reversionary Payments*," which appeared in 1783, the same year in which Wargentin died.

In 1767, Dr. Short published, in quarto, *A Comparative History of the Increase and Decrease of Mankind*, in which the tables are printed more intelligibly, and there is more information respecting foreign Bills of Mortality, than in his *New Observations*.

Dr. Price.

The first edition of Dr. Price's *Observations on Reversionary Payments* appeared in 1771, and contained "Observations on the expectations of lives, the increase of mankind, the number of inhabitants in London, and the influence of great towns on health and population," which had been published in the *Philosophical Transactions* for 1769, and added considerably to the information on those subjects which had been previously before the public; also observations on the proper methods of constructing tables of mortality.

Drs. Haygarth and Percival.

In the *Philosophical Transactions* for the years 1774 and 1775, were inserted two excellent papers by Dr. Haygarth of Chester, in which he gave the Bills of Mortality for that city, for the years 1772 and 1773 respectively, in a form calculated to exhibit, at one view, the most useful and interesting information such bills can afford without calculation, and presenting to the calculator *data* that are essential to the solution of the most important questions respecting the state of the population. Three papers by Dr. Percival (also of considerable merit) appeared in the same *Transactions* about this time, relating principally to the population of Manchester and its neighbourhood.

Dr. Moehsen.

The second part of Dr. Moehsen's "Collection of Observations for the better illustration of the great usefulness and value of Inoculation for the Small-pox,"[1] was published in 1775; in which he gave a good historical account of

[1] *Sammlung merkwurdiger Erfahrungen die den Werth und grossen Nutzen der Pocken-inoculation. Erstes Stuck, Lubeck* 1774; *Zweites und Drittes Stuck, Berlin und Leipzig* 1775. The third part, however, appears never to have been published, though stated in the title, and no doubt intended to accompany the second. Indeed at the end of the second part he gave notice that his remarks on his third table would be continued, and explanations of the remaining ones would be given, in the following part; which, however, is wanting.

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the first institution of Registers of Births, Marriages, and Deaths, and of their gradual progress and useful applications down to his time; also twenty-six tables derived from the Berlin Bills of Mortality for a period of seventeen years, commencing with 1758, and ending with 1774.

For each of the seventeen years he gave in the text what he called a Year Table, shewing for that year the number of deaths by small-pox, which took place during each month, in each of the first five years of age separately, and also in each interval of five years of age above that, with the number during the whole year in each of those intervals of age, the total number in each month of the year and also in the whole year; so far without distinction of sex or condition. But he added in each of those tables, the distribution of the number who died in the year by the small-pox into the civil and military population, shewing for each of these classes how many of each sex were children and how many adults, taking the age of fifteen years as the limit between them, without noticing the month or the interval of age in which the deaths took place. And in an 18th table he gave the same information for the first half of the year 1775. At page 152, he gave a table shewing the number of deaths in Berlin during each of those seventeen years, from all causes without distinction, but distinguishing the civil from the military population, and the sexes in each case. Amongst these deaths the still-born are included, which it is important to notice here, as he did not mention it. At the end he gave seven other which he called Principal Tables; the three first are summaries of his Year Tables; the first exhibiting at one view the number of deaths by small-pox in each month of each of the seventeen years, also those in each month during the whole term, with the whole number during each year, and the total during the whole term of seventeen years, without distinction of age, sex, or condition. The second shews the number of those deaths in each year, and the sum of them in all the years, distinguishing the sexes, the civil from the military population, and children from adults. The third shews the number of those deaths in each interval of age that took place in each year, and also during the whole term, without noticing the particulars given in the two first tables. In the fourth table he gave the numbers of male and female children separately which were born in each month of each of the seventeen years, with the total number in each year, and the total number born in each month during the whole term of seventeen years, but without mentioning whether the still-born were included in these statements or not; it seems probable that they were, as he included them in the deaths.

Taking the numbers of births and deaths, as stated by Dr. Moehsen, without attending to the still-born, it appears that

	Males.	Females.	Both sexes.
The whole number born during the seventeen years was	33,915	31,718	65,633
While there died of the civil population	30,473	30,153	60,626
Of the military	11,166	9,341	20,507
Total	41,639	39,494	81,133
Exceeding the births by	7724	7776	15,500

His fifth table shews how many children were still-born, and how many died during each of those seventeen years, also during the whole term, by each of thirteen different diseases which are the most prevalent amongst "children and others," but without distinction of age, sex, or condition, and without including the small-pox, respecting which the same information was given both in his first and third tables; that makes fourteen, of which he has given this information. But two of them, *Rittlen* and *Masern*, appear to be only different forms or varieties of what we denominate measles, whilst of some other heads or denominations in the Berlin bills, probably each included several distinct diseases; as *disease of the chest* and *consumption*, both distinguished from *phthisis (Swindsucht)* which is given separately. But these Dr. Moehsen could only give as he found them in the Weekly Bills of Mortality, from which he states that he formed his Tables.

His sixth table shews the number of suicides that took place in each month of those seventeen years, and also during the whole term, in the five different divisions following, viz., by shooting, hanging, cutting the throat, drowning, and otherwise; also the number of deaths by accidents in forty-nine different ways, the whole number being 447; distinguishing the civil from the military population, males from females, and children from adults, but without stating the months in which the deaths took place. Amongst those causes of death, except drowning and sudden death, the numbers by which were ninety and one hundred and thirty-one respectively, the greatest number, thirty-nine, was of those who died by hunger and misery in the year 1772. Always excluding the still-born; the number of deaths in 1772 was 8314, whilst the annual average number of the remaining sixteen years was only 4339; so that in 1772 the mortality was nearly twice as great as on the average of the other sixteen years of the term, which shews how small a number of deaths is imputed in the bills to hunger and destitution in comparison with those which, although ascribed to other causes, were hastened and chiefly produced by want and misery.

The seventh table shews for the year 1774 alone, the number of the still-born, the number of deaths by unknown diseases, and the number of them produced by each of seventy-three different diseases and casualties according to the Berlin Weekly Bills, which took place in each month of that year and during the whole year, with distinction of the civil from the military population, males from females, and children from adults. The whole number of deaths, including the still-born in that year, was 4401; still-born 259, deaths by unknown diseases 276.

Dr. Moehsen states that the diseases were first introduced into the Bills of Mortality at Berlin in the year 1721. The sexton of every parish had some years before been ordered to leave at the senate-house, at the end of every week, a list of the names of all who had been baptized, married, or buried during that week; and in the case of the buried, the age at which, and the disease by which, each death took place, were also to be stated. But these orders were not properly attended to until 1733; from that year he made and preserved abridged extracts from them until 1753, when these were destroyed by fire. In 1757, he resumed his labours which we have here given an account of, more minute than in most other cases, but not more so than their value appears to entitle them to, whether for their useful applications or as examples worthy of being followed.

M. Moheau

In 1778 was published at Paris, in octavo, the work entitled *Recherches et Considérations sur la Population de la France*, par M. Moheau. This book is agreeably written, in a way entirely popular, and will probably be perused with more pleasure by the generality of readers than most others on the subject of population. It contains a great number of tables, for many of which he was indebted to other writers, especially to M. Messance; but he has also given many that are original, derived from the Bills of Mortality and actual enumerations of the people, though without explaining in a satisfactory manner how he obtained his information, which, if it be correct, must have cost great labour. In his preface he says, "il est tel page de ce livre qui a coûté nécessairement deux mois de travail, et un volume de chiffres."

Mortality, Bills of.

The fourth edition of Dr. Price's *Observations on Reversionary Payments* appeared in 1783, and contained much new and valuable information on these subjects, as has already been stated above, and in the historical introduction to the article ANNUITIES.

M. Krafft.

In 1786 was published, at Petersburgh, in the *Acts of the Academy of Sciences* there, for the year 1782, an essay by M. Krafft, on the marriages, births, and burials, at St. Petersburgh, during a period of seventeen years, from 1764 to 1780, preceded by a general exposition of the uses such tables might be applied to, if the observations they record were extended over entire governments in Russia. This paper contains seventeen tables, which shew the number of deaths at each age, and by each of the principal diseases, together with the numbers of marriages and baptisms; the numbers in each case, being given for each of the seventeen years separately, as well as for the whole term; and the sexes are always distinguished; as are likewise foreigners from the native Russians.

These tables would have been rendered very valuable, had they been accompanied by statements of the numbers of the living of each sex in the different intervals of age; but for want of this information, it is difficult to apply them to any useful purpose, and many of the inferences M. Krafft has drawn from them are very uncertain.

Dr. Heysham.

During a period of nine years, commencing with 1779, and ending with 1787, Dr. Heysham of Carlisle kept accurate registers of the births, and of the deaths at all ages, in the two parishes which comprehend that city and its environs; also the diseases or casualties which the deaths at each age were occasioned by; and the sexes were in all cases distinguished. These excellent registers were kept with great care and skill on the plan of Dr. Haygarth above mentioned, and included all dissenters within the two parishes. Dr. Heysham published them from year to year as they were made, and accompanied them with valuable observations on the state of the weather and diseases in each year. Their value was greatly enhanced by two enumerations of the people within the two parishes, one made in January 1780, the other in December 1787, in both of which the ages were distinguished, but not the sexes of each age, though the totals of each sex were. These documents, printed in convenient forms, with further information respecting them, and many useful tables deduced from them, may be found in Mr. Milne's *Treatise on Annuities*.

Mr. Barton

In the third volume of the *Transactions of the American Philosophical Society*, published in 1793, were inserted *Observations on the probabilities of the duration of human life, and on the progress of population in the United States of America*, contained in a letter from Mr. Barton, which had been read to the Society in March 1791; also a postscript to that letter, read in December following; the returns of an actual enumeration of the people of the United States having been made in the meantime. The information there given from the parish registers is of little value. In the enumerations the sexes were distinguished but not the ages, except the numbers of free white males under and above sixteen; but even that information with regard to the population of America is very interesting, whether we contrast the early with the more recently settled counties, or the whole of the United States with the population of Europe.

M. Nicander.

M. Wargentin having died in 1783, M. Henrich Nicander was in the following year appointed his successor as astronomer and secretary of the Royal Academy of Sciences at Stockholm; and in 1791 as one of the royal commissioners of the Tabell-Verket, and their secretary. After the death of M. Wargentin, and perhaps for some time before, owing to his infirmities, the Tabell-Verket would appear not to have been duly attended to; no communications of the results having been made to the public for fifteen years after his decease. But other new commissioners were appointed at the same time as M. Nicander, and he commenced the performance of the duties of his office by forming a catalogue of the acts and tables in the archives of the commissioners, when he found so many deficiencies in the returns from different parts of the kingdom, and so little assistance was afforded him, that it was not until the year 1799 that he was enabled to commence the publication of the most important results for the term of twenty-three years ended with 1795, and he continued to insert papers on that subject in the same transactions for the remainder of his life; he died in 1815. The following statement will facilitate reference to those papers, eighteen in number.

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In the vol. for the year.	No. of papers.	Stating the results of observations made during the term of	
1799	2	23 years.	1773—1795.
1800	4		
1801	2		
1805	3	8 ...	1796—1803.
1809	3	5 ...	1801—1805.
1813	2	5 ...	1806—1810.
1814	2	2 ...	1811 and 1812.

The most valuable information contained in these papers is the mean number of persons living of each sex, in each interval of age during a certain number of years, and the annual average number of deaths of persons of each sex in the same intervals of age which took place during the same time; as these data are sufficient for determining the law of mortality for each sex separately, and also for the whole population without distinction of sex. That information M. Nicander has given for all Sweden and Finland in his first paper in the transactions for 1801, both for the whole period of twenty years, 1776–1795, and for each of the four consecutive periods of five years contained in the same term; also derived from these, the proportion of the annual average number of deaths to the mean number of the living of each sex in each interval of age. And in the volume for 1809, (tab. B,) he gave the same information as to the population and mortality during the term of five years ending with 1805. In the volume for 1813, he gave the number of deaths of persons of each sex, which took place in each interval of age during every one of the five years, 1806–1810; also the number of living persons of each sex in each interval of age at the end of the year 1810. In the volume for 1814, he gave the number of deaths of persons of each sex in each interval of age which took place in each of the two years 1811 and 1812. And in all cases the numbers born alive and still-born of each sex were also given separately, but the still-born were never included among the deaths.

Sweden having lost Finland by the war with Russia in 1808, the observations recorded by M. Nicander in the volumes of the *Stockholm Transactions* for 1813 and 1814, were made in Sweden alone. The operations of the Tabell-Verket never extended to Swedish Pomerania, the Isle of Rugen, or the town of Wismar.

In the sixth and last paper of M. Wargentin, in the *Stockholm Transactions* for 1755, he gave a table shewing the proportion of the whole number of deaths produced by each of about thirty of the principal diseases; in all Sweden, in Stockholm alone, within the London bills of mortality, and in Berlin. But at that time complete returns from the whole of Sweden had only been received for the two years 1749 and 1750; and from Stockholm for the five years 1749–1753. Forty-six years from that time had elapsed without any thing further having been published on the mortality from different diseases in Sweden, when M.

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Nicander resumed it in his second paper in the *Stockholm Transactions* for 1801, where, in table T, he gave for each of the twenty-one years 1775–1795, the number of deaths produced by each of thirty-seven different diseases, besides these four other causes, child-bearing, the infirmities of age, unknown diseases, accidents and other violent deaths; with the annual average number by each cause, and the proportionate number produced by each cause, out of a total number of 10,000 deaths.

In table U he gave for each diocese in the kingdom, for Stockholm and for Carlscrona, each separately, also for the whole of the kingdom, the annual average number of deaths during the same period of twenty-one years, produced by each of the causes above mentioned, without distinction of the sexes, except for the whole kingdom taken together; for which the average was given from each cause for males and females separately, and also for the whole population, without distinction of sex. M. Nicander continued his papers on the mortality produced by different diseases in Sweden, in the same *Transactions* for the years 1805, 1809, 1813, and 1814, which appears in the tabular statement of his papers given above, for the term of years there set against their respective dates of publication. But in these four papers, the mortality produced by several kindred diseases taken together was given, without distinguishing that which was produced by each disease separately. In his paper published in 1809, besides the number of deaths produced in each of the five years 1801–1805, by each disease or class of diseases, the annual average number produced by each, in every month during the same term, was given, so as to shew the effects of the seasons in increasing or diminishing the mortality from each.

M. Nicander's papers contain much valuable information which, not coming within the scope of this article, it may suffice merely to mention here. Besides the statements above mentioned, of the births and deaths in the whole of the kingdom taken together, the numbers of them which took place in the city of Stockholm, and in each of the läns or governments the country is divided into, are given separately for the period between each two consecutive enumerations of the people, with the excess or defect of the births in each case, as compared with the deaths; and the difference is compared with the increase or decrease of the population in the same period, determined by actual enumerations at its extremities. The number of marriages contracted, and the number dissolved by death during given periods, are also stated; with the number of pregnant women delivered in each interval of five years of age, from fifteen to fifty, and those above fifty; the number of those women who were married, and who were single; the numbers of double, triple, and quadruple births, distinguishing those born alive from the still-born, the legitimate from the illegitimate, and males from females. In the enumerations, the number of married persons of each sex, the numbers of widowers and widows, and the numbers unmarried above fifteen years of age, of each sex; also the number of children of each sex under that age, were given.

The numbers of the people, classed according to their ranks, conditions, and employments, were stated, with distinction of the sexes, and the number of children vaccinated in each year, from 1804. In the volume for 1813, the number of families in each of the four following classes was given:—1. the opulent; 2. other persons of property; 3. those subsisting by their labour; 4. the destitute poor; which consisted of two persons, from two to five, from five to ten, from ten to fifteen, and of more than fifteen persons; with the whole number of families of each of those five magnitudes, and also the whole number of families of each class or condition. In addition to these, tables were given for 1802, and the subsequent years, shewing how many Swedish tuns were sown of each kind of grain, also of pease, and of potatoes put into the ground, with the produce derived from each; the quantity of live stock of each kind; and the quantity of land under cultivation for each government of the kingdom separately.

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Some of the most valuable parts of these papers of M. Nicander, with deductions from them, will be found under the second section of this article.

After the death of M. Nicander, which took place in 1815, no reports on the state of the population and mortality were inserted in the *Stockholm Transactions*, where they had always appeared previously; and as books, or any information concerning them, can hardly ever be obtained from Sweden through the London booksellers, it was not till the summer of 1836 that the author of this article learnt from Professor Nilsson of Lund, who was then in London, in what way they had been published; and to that gentleman and Mr. Charles Tottie, consul-general in London for Sweden and Norway, he is indebted for a manuscript copy of the 1st, 2d, and 3d tables, at the end of this article, which give the most important information on the subject; their authenticity he considers to be sufficiently guaranteed, by his having received them through Mr. Tottie, from M. John Ad. Leyonmarck, the successor of M. Nicander, as the secretary to the Tabell-Verket, or Registry Commission; also by comparing them with the printed tables under mentioned.

The principal printed documents on the progress of population in Sweden, since the death of M. Nicander, which the author has yet succeeded in obtaining are the following:—

1. An oblong folio pamphlet, consisting of forty leaves, (each twenty-one inches by eighteen), and containing forty-two lithograph tables, most of the pages being very much crowded with small figures, shewing all the particulars above stated with respect to M. Nicander's tables, not only for the whole of Sweden, but also for the city of Stockholm, and each of the läns or governments separately, which the kingdom is divided into, for the five years 1821–1825. The number in each of the usual divisions of age, at the enumeration of 1825, is given, with distinction of the sexes, and of the country people from those residing in towns. The following were the numbers for the whole of the kingdom:—

	Males.	Females.	Both sexes.
Country people,.....	1,202,989	1,287,984	2,490,973
Inhabitants of towns,	129,981	150,298	280,279
Total,.....	1,332,970	1,438,282	2,771,252

The numbers of the people in that year, classified according to rank or condition, profession or occupation, are also given. And the number of deaths in each of the five years (1821–1825) by childbirth, also those of each sex separately, by eleven different diseases, including the principal of those prevailing among children, and those by seven different kinds of violent deaths or casualties, are stated for the city of Stockholm, and each län in the kingdom separately.

For that city, and each of those läns separately, the numbers of the people in 1805 and 1810, without distinction of age or sex; and the numbers in 1815, 1820, and 1825, both with and without that distinction are given; with the numbers of births and deaths during the two quinquennial periods 1816–1820, and 1821–1825. The divisions are indeed much more minute than these; the population of the city of Stockholm is given for nine different districts separately, and the births and deaths for twenty; this arises from the population being divided into those districts for the purposes of taxation, and the twenty others are the different congregations or places of worship, where the registers of births, deaths, and marriages, are kept. But every län in the kingdom being divided into several districts, and each district into its separate parishes; the particulars above mentioned, are

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given for each parish separately, and also the sum of those in each district, which shows the same things for it.

This is a very imperfect statement of the contents of these valuable tables, but sufficient it is hoped, to show those who take interest in such subjects, that they are worth being consulted and studied. The title is as follows: *The humble Report of the Royal Registry Commissioners to his Royal Majesty, on the Proportions of the Births and Deaths during the years* 1821–1825, *to the Population of the Kingdom in the last mentioned year; also on the observed Increase of the population of the Kingdom, during the last elapsed compared with the next preceding Decennium. Dated the* 10*th of May* 1828. Printed by the gracious command of his Royal Majesty.[1]

2. A quarto of sixty pages, with the same title, containing an abstract of the above, printed with types in the usual way, and observations and remarks which were absent from the larger tables. In it, the results of the observations made in that quinquennium (1821–1825) are compared with those of the preceding, by placing the corresponding numbers on the same line; those of the next preceding quinquennium (1816–1820) on the left; and those of the present (1821–1825) on the right of the page, with the explanation of their import between them.

These contain almost all the more important information in the larger tables, at least to persons residing out of Sweden, and are much more convenient to use. But this is defective in giving only the numbers of violent or sudden deaths, and those without distinction of sex, with hardly any information as to the numbers by different diseases, except stating in what parts of the country they produced the greatest mortality in different years.

3. A similar quarto of seventy-four pages for the quinquennium 1826–1830, with a similar title, was in 1833, handsomely printed with much larger and more beautiful types, especially the figures, which is important. The contents of the tables in possession of the Commissioners, twenty-five in number, are here stated, and then very satisfactory extracts from them are given. The number of deaths from childbirth and twelve different diseases are given; for the preceding quinquennium, the annual averages only; but for this, 1826–1830, they are stated for each year separately; but the annual average only for violent deaths, casualties, and unknown causes. As each of these gives the results of the preceding quinquennium, the two together give them for fifteen years, 1816–1830; and M. Nicander's papers in the *Stockholm Transactions*, gave the observations to the end of 1812; those for the years 1811 and 1812 being contained in the volume for 1814. So that only the observations for the three years, 1813, 1814, and 1815, are wanting to complete the series; and the most important parts of these and others are contained in the tables above mentioned, which are given at the end of this article. Whether two other quartos similar to those above mentioned, were published, with the observations made in the two preceding quinquenniums, 1811–1815, and 1816–1820, the author had not been able to ascertain when this article was printing, (in February 1837;) nor whether any other large folio tables, similar to those above mentioned, have been published; but it is probable there have not; for in the German translation of the second edition of *Forsell's Statistics of Sweden*, by the Rev. A. G. F. Freese, preacher to the royal court of Sweden, and rector of the German National Lyceum at Stockholm, (8vo, Lubeck 1835,) it is stated in a note at page sixty-seven, on entering upon the subject of the Swedish tables, that they are often quoted by foreign authors, and that the very large and instructive tables published in 1829, deserve much attention. There can be no doubt that these were the tables ordered by the king to be printed in 1828; although they might not have been published before 1829. Had there been any others of the kind, those probably would not have been so noticed, and as the translator must have had the best information on the subject, the obvious inference is, that no others existed in 1835.

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4. A folio pamphlet of three sheets extracted from the Tabell-Verket, showing the number of persons carried off by epidemic cholera in Sweden in the year 1834.[2] It contains five tables, but we shall only notice the first and most important of them here; it shows the number of deaths which were produced by that disease in the year 1834,—in every län in the kingdom, and in every town and every subdeanery in each län, in each of the usual intervals of age till twenty-five, those between twenty-five and fifty, and the number above fifty years of age; also the number in each month, without distinction of age. The estimated number of the people in each place at the commencement of that year, and the proportion of them who died of the disease are also given, the sexes being distinguished throughout. This appears to be the first publication of the number of deaths in Sweden classed according to the ages of the deceased, as well as, and together with, the causes of death. For their assistance in procuring the last mentioned and other valuable books from Sweden, the author makes his grateful acknowledgments to Mr. George Warde Norman, and Mr. H. James Prescott; also to Mr. Norman, for a manuscript table showing the number of children of each sex born alive, and the number of the still-born, without distinction of sex; with the number of deaths of persons of each sex, which took place in each of the intervals of age there mentioned, in every one of the ten years 1824–1833, in the kingdom of Norway, the authenticity of which, that gentleman has no doubt of, and therefore, neither has the author of this. In the fourth table at the end of this article, the total of those numbers for the whole term of ten years are given.

It is gratifying to see this table from Norway, so similar to the excellent form of the Swedish. In every point in which they differ, the Swedish is entitled to preference; especially in the smaller intervals of age, in which the numbers of children are given in the Swedish; and it is to be regretted, that in giving the numbers of the still-born, the sexes were not kept distinct; as the great excess of still-born males above still-born females, is an interesting subject of inquiry. It is much to be desired that these should be continued in Norway, and that periodical enumerations of the people on the Swedish plan should also be made regularly. But the author has not yet succeeded in his endeavours to ascertain whether those have been made, or are intended or not.

In the year 1800 was published, at Paris, in octavo, under the title of *Essai de Statistique*, a memoir by J. A. Mourgue, on the births, marriages, and deaths, that took place in Montpellier during a period of twenty-one years, ending with 1792, with the ages at which the deaths happened, the sexes are also distinguished, and the population of the place appears to have been nearly stationary. The tables and observations of M. Mourgue appear to be more valuable than any others relative to the population of France, that had previously been published, except those of M. Deparcieux, which related only to select orders of the people. This memoir was read at a meeting of the French National Institute in 1795, and printed in the *Mém. des Sav. Etr. an.* 14.

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[1] Kongl. Tabell-Commissionens underdaniga Berättelse till KONGL. MAJ: T. angaende Nativitetens och Mortalitetens förhallande Aren 1821 med 1825, Rikets Folkmangd sistberörde Ar, samt Folkmangdens vundna tillökning under det sistförflunta, jämnförelsevis emot det nästforutgangna decennium. Daterad den 10 Maji 1828. Pa Kongl. Maj: ts nadiga befallning till trycket befordrad.

[2] Utdrag af Tabell-Wercket öfver de i Cholera-Farsoten uti Swerige afledne personer Ar 1834. Stockholm 1836.

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An enumeration of the people in Spain was made by royal authority in the years 1768 and 1769, and again in 1787; a minute account of this last was printed at Madrid, showing for each province separately, the numbers of parishes, cities, towns, villages, &c. &c. with the number of people in each class according to their ranks, professions, occupations, &c. and the monastic orders of both sexes were particularly distinguished: to these was prefixed a summary of the census of 1768 and 1769. In these two enumerations, the ages of the people were not distinguished with sufficient minuteness; they only showed how many were under seven, between seven and sixteen, sixteen and twenty-five, twenty-five and forty, forty and fifty, and above fifty. In both enumerations, together with the ages, the distinction of the sexes was given; in the first, the married were only distinguished from the single; but that of 1787 showed how many of each sex, and in each interval of age, were in the states of celibacy, marriage, and widowhood.

A third enumeration of the people in Spain and the Spanish possessions in Europe and Africa, including the Canary Islands, was made in 1797; and a full account of it, occupying nearly fifty large tables, was printed at Madrid in 1801. The distinction of the ages in this enumeration was still not sufficiently minute; under forty it was the same as in the two preceding; but after that age, the number of the living in each interval of ten years to one hundred was given, and the number above one hundred.

No information from the parish registers in Spain was given in any of these cases; although satisfactory extracts from them all, distinguishing the ages and sexes of the deceased, or even from those only which could be most depended upon, during the ten years that intervened between the two last enumerations, would have rendered the results of these incomparably more valuable, provided that the population of the places for which correct registers were given, could be distinguished from the rest. Those to whom the superintendence of these measures were entrusted in Spain, seem to have been well aware of this, and to have actually entered upon the formation of these necessary supplements to the enumerations, as appears by the following passage extracted from the introduction to the printed statement of the last census:

"Interin que se forman las tablas necrológicas, las de nacidos y casados, en que entiende el ministerio de Estado, y que son muy utiles para valuar casi geométricamente el total de la poblacion del Reyno, debemos contentarnos con las noticias que nos proporcionen los censos executados por el método que el presente." But these tables of births, deaths, and marriages, have not yet (in the year 1836,) been published, neither does it appear probable that they were ever formed.

In 1801 were published, in quarto, *Observations on the Increase and decrease of Different Diseases, and particularly of the Plague*, by William Heberden, junior, M.D. F.R.S., containing some tables, chiefly deduced from the London bills. In the advertisement prefixed to this valuable tract, we are informed that it had been intended to be subjoined to a new edition of the Bills of Mortality; which edition, however, was not published. We are also indebted to the same ingenious physician for other interesting observations on the mortality in London, inserted in the *Philosophical Transactions of the Royal Society* (for 1796,) and in those of the *London College of Physicians*, vol. iv.

In the same year (1801) was published another valuable work, entitled, *Reports on the Diseases in London, particularly during the years* 1796, 1797, 1798, 1799, *and* 1800, in 12mo, by Robert Willan, M.D. F.A.S. part of which had been previously inserted in some periodical publications. The author's observations were made both on the Bills of Mortality, and on the cases that occurred in his own practice.

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Dr. Bateman commenced a series of similar observations and reports on the diseases of London with September 1804, which he continued till the end of August 1816. The subjects of those reports were, the cases that occurred at the Public Dispensary in London, in which he was a physician; they were first published quarterly in the *Edinburgh Medical and Physical Journal*, but the author collected them into a separate octavo volume, which he published in 1819, with an introduction, in which he gave a Historical Survey of the Diseases of London.

All of the three works last mentioned, are very interesting and instructive; but it would not be consistent with the objects of this article, to notice them further here.

By art. 1, sect. 2, of the constitution of the United States of America, it was provided that the representatives and direct taxes should be apportioned amongst the several states which should be included within the union according to their respective numbers. The first actual enumeration to be made within three years after the first meeting of the Congress of the states, and within every subsequent term of ten years, in such manner as they should by law direct.[1] In consequence of this, five enumerations of the inhabitants of the United States have been made, viz. in 1790, 1800, 1810, 1820, and 1830; statements of the first four are given in the American Almanac for 1832, and of the last in the same Almanac for 1833. In the first, as was stated above, no attention was paid to the ages, except the distinction of the numbers of free white males under and above sixteen years of age. In the enumerations of 1800, 1810, and 1820, the numbers of free white persons of each sex in five different intervals of age were ascertained; but three of the intervals were much too long to admit of the enumerations being available for determining the law of mortality; the first of those long intervals being all under ten years of age; the second, those between twenty-six and forty-five years; and the third, all above that age. Of these three enumerations, it was in that of 1820 only, that the free coloured persons and the slaves were classified according to their ages and sexes; and the intervals of age into which they were distributed, were longer than those for the free whites.

In 1830, the numbers of free white persons of each sex, in thirteen different intervals of age were determined; the four divisions under twenty years of age being of five years each; the eight between twenty and a hundred, of ten years each; and the thirteenth division included those of a hundred years of age, and upwards. The numbers of each sex, of free coloured persons, and of slaves separately of each sex, in each of the following divisions of age, were ascertained. Between 0 and 10, 10 and 24, 24 and 36, 36 and 55, 55 and 100, and above 100. These particulars were given for each state and territory separately, and also the totals for the whole of the United States. Statements of all the five enumerations from that of 1790 to that of 1830, both inclusive, may be seen in the American Almanac for the year 1832. That of 1830, with the ages of the living for each state and territory will be found in the same Almanac for 1833. No general returns of the numbers of births, marriages, and deaths, appear to have been required or made throughout the United States; and previous to the

[1] Dr. Seybert, in his *Statistical Annals of the United States of America*, published in 1818, (p. 17) makes the following statement: "The United States of America alone require an actual enumeration of the inhabitants to be made at regular intervals; as far as our knowledge extends, no other instance can be furnished from the history of mankind; our practice is worthy of being followed by other nations." And a statement to the same effect is made in the American Almanac for the year 1832, (p. 156) by which it would appear, that the writers were not aware of Sweden having set a still better example of that kind more than thirty years before.

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year 1820, but few births were registered there. Many marriages were till then, and probably still are, contracted before magistrates, whose records of them were seldom preserved.[1]

In the city and liberties of Philadelphia more attention appears to have been paid to these subjects than in almost any other part of the United States. In the first number of the *American Journal of the Medical Sciences*, published at Philadelphia in November 1827, in octavo, there is an excellent article (the 8th), entitled, *Medical Statistics: being a series of Tables, showing the Mortality in Philadelphia, and its immediate causes, during a period of twenty years, by Gouverneur Emerson, M.D.* Dr. Emerson states, that the subject of the diseases and mortality of Philadelphia, was first made one of regular record in the year 1807, through the influence and exertions of Professor James, and that "their authenticity may be regarded as resting on very solid grounds." From authority vested in the Board of "Health, this municipal power makes it obligatory upon physicians to give certificates designating the name, age, and sex, of all who die under their care; and sextons are bound by still heavier penalties, not to permit the interment of any dead body, until such certificate is obtained, which he returns to the health office on the last day of every week, for publication. The accuracy with which the diseases are designated in these certificates, rests chiefly upon the general intelligence of the medical profession in that city, the members of which are very much in the practice of testing their pathological opinions by autopsical examinations. For the purpose of ascertaining the number born, the various practitioners of midwifery are required to render an account at the health office of all births. With regard, however, to this department, there is some reason to suspect a deficiency in the returns, especially from the outskirts of the city and liberties. But the registry of the dead has, for the most part, been kept with a care and fidelity creditable to those who have had its superintendence."

Dr. Emerson after making some general observations on the topography and climate of Philadelphia, proceeds with his observations on the eleven valuable tables which are inserted at the end of the article.

The *first* shows the results for each calendar month of thermometrical observations made at Philadelphia, during the term of ten years, which commenced with March 1811, and ended with February 1820. The *second* is an abstract of the census of the city and county of Philadelphia, taken by order of the general government in 1820.

All the observations on the Mortality were made within the period of twenty years, which commenced with 1807 and ended with 1826; the still-born being always, as they should be, given separately, and not included amongst the deaths; except in Table IV., which shows the number of deaths in each month of each of the twenty years; the Board of Health having found it impracticable to make an accurate monthly estimate of them for deduction.

In the number stated in the Philadelphia bills to be still-born, the abortions are included. The fifth and eleventh of these tables are the most valuable. In the fifth are stated the numbers of deaths from the principal diseases during the whole period of twenty years in the following intervals of age, viz. between birth and one year completed, between one and two years, between two and five, between five and ten; then in each interval of ten years of age to a hundred and twenty; fifty-five deaths having happened between the ages of a hundred and a hundred and ten, and six between a hundred and ten and a hundred and twenty. After the columns set apart for those fifteen different intervals of age, in a sixteenth the number of deaths produced by each disease at ages not ascertained, is given; and in the seventeenth and last column, the total number of deaths produced by each of those diseases. The total number of diseases in the table is sixty-six, and the number of causes of death, old age being included, is sixty-seven.

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A few cases of deaths occasioned by accidents and diseases of vague character, Dr. Emerson omitted, as tending rather to perplex than to elucidate the subject; and adopted the alphabetical arrangement in this table, as the most convenient.

The total number of deaths registered during the term of twenty years was 53,004, whilst the number included in this fifth table was 50,614; so that 2390 were excluded for the reason just stated.

Dr. Emerson's other tables and his observations on the whole of them, will be found well worth the attention of those who take interest in the subject.

In *Hazard's Register of Pensylvania* for July 30, 1831, (No. 5, vol. viij.) there is an elaborate paper entitled, Comparative Views of the population of the city and county of Philadelphia, from the time of the first census in 1790, till that of the last in 1830; in which the number of white persons of each sex in that city and county at the time of the census of 1830, in each of the thirteen intervals of age, stated above to have been adopted throughout the United States at that census, is given; and the same information is given as to the coloured population at that time, but distributed into the six intervals of age only, above stated to have been adopted for them. The number of whites was 173,345; of coloured persons, 15,595; total, 188,940.

A statement of the deaths which took place within the Bills of Mortality during the term of ten years 1821–1830, is also given for the whole population without distinction of colour or sex, and distributed into the following sixteen intervals of age in which they happened, viz. under one year, between one and two, between two and five, then in each of the three intervals of five years each to twenty, and the remaining ten intervals of ten years each between twenty and a hundred and twenty; thirty-two persons having died between a hundred and a hundred and ten years of age, and five between a hundred and ten and a hundred and twenty. The whole number of those deaths, which did not include the still-born, was 37,914.

The number of births of each sex in each of the ten years 1821–1830, is also given, including the still-born, but without distinction of colour; and the number of still-born for each year separately, but without distinction either of colour or sex.

The number of deaths in each of the ten years is stated separately, both with and without distinction of sex, but always without distinction of age; and it is only where the whole number of deaths of both sexes without distinction, in each of the ten years is stated, that the division of it into

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[1] In consequence of the notice which was taken in the first edition of this article, published in the Supplement to the Encyclopædia Britannica, in June 1817, of the enumerations of the people, and the published extracts from the parish registers in the United States, with some suggestions for improving the best of them, those of Philadelphia, and increasing their usefulness, John Vaughan, Esq., the Librarian of the American Philosophical Society, had the goodness to communicate to the author in June 1818, most of the information given above, as to the state of things down to that time, both in the United States generally, and in Philadelphia in particular; with eight of the annual statements (all he could procure and part with,) of the Board of Health in Philadelphia, showing the number of deaths at every age by each disease or other cause, in that city and its liberties; and several American newspapers, showing the number of deaths in each of the same intervals of age, the number in each month of the year, and the number of deaths by each cause, without in this last case, stating at what ages they happened, in *Baltimore, Boston, Charleston, New York, Philadelphia, Salem,* and *Washington;* for which the author feels it incumbent upon him to acknowledge his obligations, and express his gratitude in this place.

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the numbers of white and coloured persons is given; in these numbers of deaths without distinction of age, the still-born are included. So that these documents do not enable us to determine out of how many persons of each sex, one died annually during the ten years 1821–1830.

Taking the limits of the Bills of Mortality from Dr. Emerson's second table, where he stated the wards and districts from which the returns of interments were made, and the population of each at the census in 1820, amounting in all to 121,980; and assuming the limits of the bills to have been the same in 1830, the population within them at the census of that year, was, according to Hazard's Register, 171,212; and the mean number of the people during the intervening ten years, appears to have been 146,596.[1] The number of deaths in the same time, exclusive of the still-born, was, according to the statement with the ages, 37,914; according to that without the ages, 37,814; taking 37,864, the mean between these for the true number, we find that there died annually on an average of those ten years, one person for every (38·7165 or nearly) thirty-nine in the whole population. The number of persons in the city and county at the census of 1820 was 137,097, at that of 1830, 188,961, mean number during the intervening ten years, 163,029.

The following statement of the progress of population in the city alone of Philadelphia, appears to be sufficiently interesting to deserve a place here.

In the year	No. of the people.	No. of square feet for each person.	No. of persons to a sq. mile.
1790	28,522	1755	15,885
1800	41,220	1216	22,926
1810	53,722	933	29,880
1820	63,802	786	35,469
1830	80,458	623	44,749

The three first columns are taken from the article above mentioned in Hazard's Register; but since the numbers in the third are proportional to the rarity of the population at the five enumerations, those in the fourth have been added, as they measure its density at the times of those enumerations.

The whole population of the city and county of Philadelphia, without distinction of age, sex, or colour, was distributed as follows, at the times of the enumerations in 1820 and 1830.

	In the year 1820.	In the year 1830.
In the city.....	63,802	80,458
In the suburbs.....	58,178	90,754
Total within the bills of mortality.....	121,980	171,212
In the rest of the county	15,117	17,749
Total within the city and county.....	137,097	188,961

(Hazard's Register, vol. viii. p. 65.)

Here the inhabitants of Blockley, amounting
in 1820 to 2655,
in 1830 to 3401,

are included within the suburbs and bills of mortality. It is much to be regretted that in the census of 1830, the coloured population were not distributed into the same intervals of age as the whites; also that the colours and sexes of those who died within the bills of mortality during the ten years, 1821–1830, were not distinguished in the published statements, as well as the ages. Dr. Emerson was of opinion that the rate of mortality amongst the coloured population was much greater than amongst the whites.

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It is equally to be regretted that, while the bills of mortality extended only to the city and suburbs, of which the mean population during the ten years, 1821–1830, was 146,596, the enumeration of that portion of the population of the city and county distributed into the different intervals of age, with distinction of the colours and sexes, was not given separately. For with such documents as are before us, even if the enumeration of 1820 had been made exactly in the same manner as that of 1830; in attempting to determine the rate of mortality in any interval of age, we should only have the means of comparing the annual average number of deaths which took place in that interval within the bills of mortality, with the mean number of the people in the same internal of age in the whole of the city and county. But the mean population

within the bills of mortality was only.....	146,596
while that of the whole city and county was.....	163,029
that is.....	16,433

or about one-ninth greater.

The difficulty arising from this would not be great, if the population without the bills were known to be distributed into the different intervals of age in a manner similar to that within them; but there is no doubt of the distribution in the two cases being very dissimilar; for, excluding the still-born both from the numbers of the births and of the deaths, during the ten years ended with 1830,

The total number born within the bills of mortality was.....	61,945
Total number of deaths in the same time.....	37,814
Increase of population, within the bills, by procreation	24,131
While the increase from all causes during these ten years, was.....	49,232
So that the increase by migration must have been.....	25,101

within the bills of mortality; that is, one twenty-fourth part greater than by procreation. The part of the county without the bills certainly could not have been increased in a like proportion in the same way; therefore the population without the bills must have been much more dense at early ages, and more rare at the advanced ones, in comparison with the population within them, than in proportion to the mean number of the people of all ages, without and within the bills respectively. Whence it is manifest that nothing but enumerations of the people in each interval of age, within the limits of the bills, at each extremity of the period for which the annual deaths at the different periods of life are given, can make either those enumerations or the registers of deaths, available for the most important purposes they can be applied to.

In pursuance of an act of Parliament (41 Geo. III. cap. 15), an enumeration of the people in Great Britain was made in 1801; also returns of the baptisms and burials in England and Wales, during the year 1700, and every tenth year after that till 1780, then for every year to 1800 inclusive, with the number of marriages in each year, from the commencement of 1754 to the end of 1800. Large and clear abstracts of the answers and returns to this act were printed

[1] Including the township of Blockley in the limits of the bills according to Dr. Emerson, although in the register it is removed from them and placed in the rest of the county. If the interments in or from Blockley were not included in the bills, the annual average mortality must have been one of 37·9167.

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by order of the House of Commons in 1802, and occupy more than one thousand pages folio. In 1811, another act (51 Geo. III. cap. 6), was passed, "for taking an account of the population of Great Britain, and the increase or diminution thereof;" in consequence of which, returns were that year made to Parliament, of the number of persons in every part of Great Britain; also of the numbers of baptisms, burials, and marriages in England and Wales, during each of the preceding ten years; very satisfactory abstracts of these were also printed by order of the House of Commons, in 1812, with some preliminary observations, in which corrections of the preceding returns are given.

The sexes were distinguished both in these enumerations and extracts from the registers, but the ages in none of them; and the proportions of males to females among the living are not to be depended upon, a number of males in the army and navy, which it is difficult to estimate, not being natives of Great Britain, nor usually resident there. The returns of baptisms and burials were also defective, but few registers of Dissenters having been included in them.

These abstracts are, however, with respect to the objects they extend to, more minute and satisfactory, than any other accounts of the same kind that had previously been published; and it was very desirable that such returns should have continued to be made, and abstracts of them to be printed at regular intervals; for nothing is so well calculated to shew the influence of different causes on the prosperity of a nation, as the comparison of the different states of the population, and the rate of its progress or declension, under different circumstances; besides, the value of the abstracts, once obtained, will be much enhanced by the publication of others of a similar kind thereafter.

It is much to be regretted, that no information as to the ages of the living, or those at which the deaths took place, was required by either of the acts above referred to, nor any encouragement or facility afforded to those who might be disposed to collect such information; and, consequently, that none was given in the returns.

Without better regulations for the keeping of mortuary registers than those heretofore in force, without such as should extend to dissenters of every denomination, it would probably be better not to require returns of the ages of the deceased from all parts of the kingdom; for defective or inaccurate returns would only mislead; and, not to mention the difficulty and expense of procuring returns of the ages of all the living, they would be comparatively of little use, where those of the dead were wanting.

But if government were to print forms for making returns both of the numbers of the living and of the annual deaths in proper intervals of age, throughout the extent of life; only sending these forms along with those now in use, to such as should apply for them; then persons who take an interest in such inquiries, and have the means of making correct returns, might do so with advantage. And a summary of all of that kind made from different parts of the kingdom, would convey much important information. Returns also, from such places only as were similarly circumstanced, might be collected into as many summaries as there were material varieties in the circumstances; and thus would afford the means of determining the different modifications of the law of mortality, which different circumstances produce. If the diseases that occasioned the deaths were also inserted, the greater prevalence of particular diseases in some circumstances than in others, would be apparent, with their effects, and the probable means of preventing them, or lessening their mortality.

But, *the population enumerated must always be precisely that which produces the deaths registered; the grand desideratum being, to determine the number of annual deaths at each age, which takes place among a given number of the living at the same age.*

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Mr. Milne's *Treatise on Annuities and Assurances* was published in 1815, and contains clear abstracts of the most important statements of this kind that had been published between Dr. Price's time and the date of its publication; these will, we believe, be found to be much more valuable than any thing of the kind that was extant when that respectable author wrote, whose work had long been referred to for the best information on such subjects.

Since the first publication (in 1817[1]) of what has been stated above respecting the two first enumerations of the people in Great Britain, and the extracts from the parish registers of England and Wales, two other enumerations have been made in 1821 and 1831; and abstracts of the answers and returns under the acts that required them, (1 Geo. IV. cap. 94, and 11 Geo. IV. cap. 30), have been printed by order of the House of Commons, (in 1822 and 1833 respectively.) The extracts from the parish registers, shewing in each case the numbers of births, marriages, and burials, returned for each of the ten years next preceding that of the enumeration. The principal difference between the queries put at the two enumerations of 1811 and 1821 was, that in 1811 no inquiry was made as to the ages of the people, while in 1821, after nearly the same questions had, according to the act, been put to the overseers in England, and to the schoolmasters in Scotland, the following instructions as to the ages of the people were given: "If you are of opinion that in making the preceding inquiries, (as to the number of families and persons), the ages of the several individuals can be obtained in a manner satisfactory to yourself, and not inconvenient to the parties, be pleased to state the number of those who are under five years of age," &c. The thirteen intervals of age into which the persons of each sex separately were to be distributed, being these: 4 of 5 years each from birth to 20 years of age; then 8 of 10 years each to 100; the thirteenth including all those above 100 years of age. Thus it was left optional with the returning officer whether this important question should be put, and with the party interrogated, whether it should be answered or not; from which it would appear that this part of the inquiry was not intended to be made with much correctness, and those whose onerous duty it was to put the question in populous places, might easily lighten the burden; accordingly, from such places the ages of a considerable part of the population were not returned. None were obtained from Manchester, Newcastle-upon-Tyne, or Sunderland. The proportion of the ages which were not returned was, in Birmingham, about $\frac{4}{5}\frac{9}{0}$ths, in Leeds, $\frac{1}{4}$th, in Bristol, $\frac{1}{6}$th of the returned population. In Middlesex, $\frac{1}{5}$th, York, east riding, $\frac{1}{5}$th, north riding, $\frac{1}{7}$th, in Lancashire, $\frac{1}{6}$th, in Warwickshire, $\frac{1}{3}$d, evidently owing to the large manufacturing towns they contain, especially Birmingham, the population of which is more than a third of that of the county of Warwick. These deficiencies in the returns may reasonably be ascribed to the option which was offered to the overseers, who, however, performed the duty imposed upon them with great good will and attention, as appears by the complete return of ages where the obstacles were not too great.

That the people were not unwilling to state their ages, may be inferred from the complete returns of them from Hull, Liverpool, Portsmouth, Plymouth, and Great Yarmouth, as well as from every city in England, if we mistake not, except London, Canterbury, and Bristol. From the counties of Bedford, Chester, Rutland, and Leicester, nearly the whole were obtained; and from those of Lincoln, Norfolk, Suffolk, and Wilts, the deficiency was only on an aver-

[1] In the *Supplement* to former editions of this work.

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age about one-thirtieth, while from all Wales it was only a forty-second part of the whole.[1]

The following table may throw some light on the influence of large manufacturing towns, migration, and some other circumstances, in producing a more or less complete return of the ages of the people at that enumeration. It being borne in mind that from Glasgow the whole were returned.

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Omitting the army, navy, marines, and seamen in registered vessels.

	Both sexes.	For every million of each sex, the number whose ages were not returned, was, of		Excess of Females.	Excess of Females for every 100 males.	
	100 ages were not returned out of	Males.	Females.		In the whole population.	Among those whose ages were not returned.
In England,.....	787	123,053	130,880	7,827	5·36	6·36
— Wales,.....	4164	23,776	24,240	464	4·70	1·95
— England and Wales,.....	827	117,359	124,512	7,153	5·32	6·09
— Scotland,.....	1531	61,016	69,139	8,123	12·85	13·31
— Do., omitting Glasgow,.....	1423	65,556	74,431	8,875	11·55	13·54
— Great Britain,.....	888	108,999	116,048	7,049	6·41	6·47

With regard to the extracts from the parish registers, the principal difference between the questions put in 1831 and at the three preceding decennial periods of enumeration, was, that in these no inquiry was made as to the ages at which the deaths happened, while in 1831 the officiating minister of every church or chapel was requested to state the ages of the individuals of each sex entered in his burial register, during each of the eighteen years 1813—1830, in consequence of which the ages of 3,938,496 persons buried during those eighteen years were returned, 1,996,195 males, and 1,942,301 females. The number of each sex separately, and of both sexes, who died in each year of age during every one of the eighteen years, in all England and Wales, according to the returns, were given in the preface to the *Enumeration Abstract*, (pp. 36–42); besides which, a similar table was also given for each county separately, and sometimes for its principal town, at the end of the returns from that county, in the *Parish Register Abstract*.

Omitting the army, &c., as above mentioned, the whole returned population in 1821 was 11,978,875 persons; but the ages of 10,530,671 only were obtained, the number of persons whose ages were not obtained having been 1,448,204. As the ages withheld were generally those of residents in large manufacturing towns, whilst those returned were from the rest of the population, and a considerable proportion of the former class had migrated from the latter, many of them probably about the age of puberty; there are good reasons for believing that the ages returned and those omitted were not similarly distributed, as to their numbers, into the different periods of life; so that, although the total number omitted be given, they cannot be interpolated in their proper places by calculation or otherwise, among the ages returned.

In the returns of burials at different ages, there are also omissions, which can only be guessed at. Thus it appears that these documents, after all the pains and expense they have cost, do not afford the means of determining the law of mortality, although that undoubtedly is the most important purpose to which enumerations and registers of these kinds can be applied.

The act 6 and 7 Wm. IV., cap. 86, passed in August 1836, is likely to secure satisfactory records of marriages, births, and deaths, in England; but the abortive and still-born should be distinguished from the children born alive, which does not appear to be provided for. They may, indeed, be entered as abortive or still-born, under the cause of death, in the register of burials; if that be done, they should be carefully excluded from the number of deaths, in making extracts or returns, and stated separately. And if, at the future decennial enumerations, the ages of the people be determined with corresponding accuracy, the values both of the enumerations and registers will be greatly enhanced, and the law of mortality, with much other important information, may be derived from them. The insertion of the *cause* of death, in the register of it, is of itself a great improvement.

As has already been observed in the article ANNUITIES, (p. 209, col. 2), it is much to be regretted that in the population returns of 1831, the people were not classed according to their ages, as in 1821; but without giving any option either to the party by whom or to whom the question on that subject was required to be put, as to putting or answering it. It appears highly probable that there would be no occasion to impose any penalty for refusing to answer that question, or for giving wilfully an incorrect answer; and in the few cases where it might be so given, or altogether withheld, if a memorandum were made of it, the desired information might afterwards be obtained nearly enough from other parties; if it came but within the right interval of age, that would be sufficient. It is true that in the present defective state of the returns of births and deaths, that would not have enabled us to determine the law of mortality in a satisfactory manner; but with the returns of 1821, and those of a similar kind to be made at the future enumerations, it would have been of great use. Indeed it must be obvious to all, that one of the greatest uses of such periodical inquiries into the state of the population, is to ascertain its progress, by comparing the returns at the several successive periods, which can only be done satisfactorily when the same method of proceeding is adhered to at each, or as nearly so as may be consistent with the introduction of improvements into it.

Dr. Robert Watt's *Inquiry into the Relative Mortality of the Principal Diseases of Children, and the numbers who died under ten years of age in Glasgow during the thirty years* 1783–1812, forming the appendix to his *Treatise on Chincough*, was published with it, in 8vo. in 1813.

He states, (p. 336,) that, "on inquiring into the state of

[1] Those above mentioned are only a few cases, others may be easily found in the Population Abstract. The ages of the inhabitants of London *within the walls* were very nearly all returned; those of Canterbury were deficient by $\frac{1}{26}$th part of the whole.

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the Registers of the City, he found something of that kind had existed from a very remote period; but that it was only from the commencement of the year 1783 that they had been kept in a regular manner." The Bills extended to the suburbs as well as the city, and he stated that so early as the year 1798, more than half of the funerals were without the city. With the most laudable zeal and unwearied industry, he collected from the different registers of burials contained in fifteen folio volumes, for every one of those thirty years, the number of children under ten years of age who died in each month of that year, by each of eight different diseases, (counting fevers of all kinds as one disease only, designated by the term *fever*, according to the bills,) the number of the abortive and still-born, and the numbers of deaths under two years of age, between two and five, and between five and ten; and gave a separate table exhibiting those particulars for each of the thirty years; shewing also the total number of deaths during the whole of each year from each of the causes, and in each of the intervals of age above mentioned; with the whole number of deaths at all ages, and from all causes that took place in each year.

Then, dividing the whole term of thirty years into five periods of six years each, he gave a table (his 31st) shewing how many deaths took place in that period from each of the causes and in each of the intervals of age above mentioned, for every hundred in the whole numbers of deaths, including the abortive and still-born, which took place during the same period.

The following are four of the fifteen columns in that table.

Period of six years.	For every hundred in the total number of deaths during that period, there were caused by		
	Small-pox.	Measles.	Stopping or croup.
1783—1788	19·55	0·93	2·54
1789—1794	18·22	1·17	3·33
1795—1800	18·70	2·10	2·47
Gratuitous vaccination commenced in Glasgow in 1801.			
1801—1806	8·90	3·92	4·93
1807—1812	3·90	10·76	5·18

Dr. Watt, in common with almost all others who have well considered the subject, was an advocate for vaccination; and if he overrated the degree in which the reduction of mortality effected by it was counteracted by the contemporaneous increase of mortality from other diseases; he has given abundant proof that it was neither from the want of an earnest desire to discover the truth, nor of persevering industry in the pursuit of it.

At the conclusion of his work he recommended scarlatina to be thenceforward carefully distinguished from other fevers in the bills, and expressed his opinion that it had been a very considerable cause of mortality among children for some years previous to the date of his publication.

Medical men in general, both in London and in Glasgow, dissent from the opinion of Dr. Watt, that the mortality from measles had materially increased since the introduction of vaccination; but it is supported by the Bills of Mortality both of London and Sweden, as well as those of Glasgow; the increase has also been observed both in Cornwall and at Plymouth, although the numbers there are small.[1] Perhaps this increase of mortality may take place principally among the children of the poor, who, in such cases, seldom have proper medical assistance; and either from ignorance or necessity do not sufficiently protect the patients from cold whilst labouring under the disease.

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The third edition of Dr. Cleland's *Statistical Tables relative to the City of Glasgow*, was published there (in 8vo.) in 1823, containing a good account of the population and mortality both of the city and suburbs down to that time; he there gave the bills of mortality of the city and suburbs for the year 1822, which appears to have been the first published, and continued to prepare these bills during fourteen years, 1821–1834, with great care and attention, and to publish them in the Glasgow newspapers, with the approbation of the magistracy, who cheerfully defrayed the expense.

These bills were similar to those published by Dr. Haygarth at Chester, and by Dr. Heysham at Carlisle; except that the intervals of age the numbers of deaths were given in under five years, were much less minute, and that the causes of death were not stated in Dr. Cleland's bills. That gentleman was also appointed to superintend the two enumerations of the people in the city and suburbs of Glasgow in 1821 and 1831; and having been appointed on this last occasion by the sheriff of Lanarkshire to superintend the enumeration of the county also, in a letter to the author of this article, dated February 15th 1831, he expressed his apprehensions that he should not be able to give a classification of the inhabitants of Glasgow and its suburbs according to their ages at that enumeration in the same manner as in 1821; but upon being informed, in reply, that in that case all the labour he had bestowed upon the parish registers during the ten years then elapsed would be fruitless, he answered, that, notwithstanding the extra trouble, he would prepare fresh schedules, and give the number of the people of each sex in each of the same intervals of age as in 1821, which he did accordingly; and that is the only instance, except the Carlisle enumerations in January 1780 and December 1787, of its having been done in this country.

In the year 1831, Dr. Cleland published, in a folio volume, his *Enumeration of the Inhabitants of Glasgow and Lanarkshire*, including all the details of his labours above mentioned, and, in 1832, a second edition of nearly twice the bulk; in the first, the bill of mortality for each year of the ten, 1821–1830, is given; but in the second, only those for the first and the last of them.

The following is an extract from the folio volume, (first edition, p. 11.) "From my official situation I am enabled to state, that the books of the church-yard wardens are kept with such perfect accuracy that every reliance may be placed on the number of burials in the city and suburbs."

Since the year 1834 the Glasgow bills of mortality have been prepared by Henry Paul, Esq. convener of the Committee of Churches and Church-yards, under the superintendence of a committee of the magistrates and town council, with some material improvements upon those of Dr. Cleland. The bill for 1835 contains six tables, besides *General Remarks*, the principal improvements are in the third and fourth tables, which were not given by Dr. Cleland, in both of them the sexes are always distinguished; in the third, the number of still-born children, and the number of deaths in each interval of age that took place in each month of the year is given separately; and the sum of the monthly numbers shews the same thing in each case for the whole year. But the fourth table, which is still more valuable, shews the number of deaths of each sex in each interval of age, by each of the causes most easily discriminated.

Part of these two bills have been published in the Glasgow newspapers; of that for 1836, in the *Scottish Guar-*

[1] *Sketch of the Medical Topography of the Hundred of Penwith, Cornwall*, by Dr. Forbes, part ii. p. 138, in *Trans. of Provincial Assoc.* vol. ii; and Dr. Blackmore *on the Rise and Decline of Particular Mortal Diseases*, 8vo. Plymouth 1829, from Trans. of Plymouth Institution.

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dian of the 3d of February 1837; but only the contents of the first two of the tables above mentioned for that year had been published when this article was put to press, and the author acknowledges his obligations to Mr. Paul for the copies sent him by that gentleman of the papers already published. In these the intention of the council committee is announced, to improve as they proceed, the statements of the diseases by which the deaths were occasioned; also their intention to detail, in the future bills of mortality, the particular trades and professions of those who have died; and to give a table exhibiting the mortality among children from one month up to five years of age, with a statement of the various diseases which have proved fatal at those ages; all of which improvements are very desirable.

It is much to be regretted that only about one half of the births in Glasgow and its suburbs are registered, also that certain registers in the Barony Parish burying-grounds contain no record of the cause of death. The act passed in 1836, for registering births, deaths, and marriages, extends to England only; and the committee of the city council express their opinion that these defects cannot well be supplied without some legislative enactment.

In the bills of mortality for London, Glasgow, and too many other places, the still-born have been included among the burials, as the numbers are obtained from the burial registers; although, as was observed before, p. 525, col. 1, they never should be, for in that case they are generally included among the deaths in calculating the rate of mortality, in consequence of which, that rate comes out greater than the truth in the ratio of the whole number of the registerial burials to the number interred who had lived and breathed.

The *Observations on the Mortality and Physical Management of Children*, by Mr. Roberton of Manchester, were published (in 12mo.) in 1827; it is the first part only of that valuable work, namely, the observations on the mortality amongst children, which we have occasion to notice here; and we consider that no gentleman of the medical profession has treated it better, few, if any, so well. Mr. Roberton informs us that no bill of mortality is published in Manchester, and that, before the year 1812, the ages were not entered in the registers. He extracted, with great care, the numbers of deaths under ten years of age from the register of the collegiate church of Manchester, for the term of eight years, 1816–1823; and from the valuable register at the *Rusholme Road* cemetry there, for the term of four years, ended with April 1825. The results he has stated shortly, (p. 19.) with the proportion in each interval of age under ten, to the whole number of deaths in each register; and has given a valuable table, shewing, without distinction of sex, the number of children buried in the Rusholme Road cemetry during the four years 1821–1825, who died under one month old, between one and two, two and three, three and six, six and nine, and between nine and twelve months; also between one and two years, two and three, three and five, and between five and ten years old, with the total under ten; by each of forty-seven different diseases, and twelve other causes separately. The total number of deaths under ten having been 2056, and at all ages 3559.

We have already stated in the article ANNUITIES, (vol. iii. p. 203,) that Mr. Finlaison's Report to the Lords of the Treasury, on the mortality among government annuitants in this country, was printed by order of the House of Commons in 1829. Government having raised money at different times by the sale of life annuities, either by way of tontines, with benefit of survivorship, or otherwise; a separate register of the nominees or annuitants on whose lives the annuities depended, was on each occasion kept; the name, and consequently the sex, also the age, satisfactorily certified, of each nominee at the time when the annuity commenced, with the day of death, and the age attained, were entered in the register. For each of these classes of nominees generally, but in some instances for two or three of the smaller ones combined, Mr. Finlaison has given a table, showing for each sex, 1. The number enrolled at each age last completed, during the observations; 2. The number alive of each age when the observations terminated; 3. The number who died at each age during the observations; and, 4. The number who passed on from that to the next greater age.

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Mr. Finlaison calls each of his tables above mentioned an observation, although each records several thousands of observed facts or occurrences. Of these tables he has given twenty-one, but the recorded facts, which alone we have occasion to notice here, are contained in six only of them, the other fifteen being combinations of two or more of the six, or of selections from them.

These six are the following:—

Table.	Observations on the nominees of the	No. of Lives.	No. of Deaths.
I.	English Tontine, which commenced in July 1693, the last died in 1783..... The observations in all the other cases terminated in January 1826.	1002	1002
II.	Life Annuities issued at the Exchequer in 1745, 1746, 1757, 1766, 1778, and 1779.....	2552	2396
III.	Three Irish Tontines of 1773, 1775, and 1778..... Great English Tontine of 1789.	3557	1993
IV.	*Selected* by the contributors.....	3518	1315
V.	*Drawn by lot*, (Art. ANNUITIES, p. 207).....	4831	1823
VII.	Life Annuities chargeable on the Sinking Fund, commenced in 1808.....	6892	1548
	Totals,.....	22,352	10,077

In the article ANNUITIES (pp. 202 and 203) we mentioned the desire of the members of the Equitable Assurance Society to ascertain the law of mortality which had obtained among them; and that the late Mr. Morgan, their then actuary, had been able to form a table which had induced him to alter his opinion on the subject; accordingly, in February 1834, the Society printed for the use of the members a folio pamphlet of "Tables showing the total number of persons assured in the Equitable Society, from its commencement in September 1762, to January 1, 1829, distinguishing their ages at the time of admission into the Society, and exhibiting the number of years during which they have continued members of it, the periods of life at which their assurances have terminated, and the ages which the surviving members had attained on the first of January 1829. To which are added, Tables of the Probabilities and Expectations of the duration of human life, deduced from these documents; a statement of disorders (as certified to the Court of Directors) of which 4095 persons assured have died, in thirty-two years, ending December 31, 1832; and a Supplement, showing the mortality of the Society for the years 1829, 1830, 1831, and 1832." With an introduction by Mr. Arthur Morgan, who succeeded his father as actuary of the Society.

By these documents it appears that, of the persons whose lives were assured in the Society during the period of 66¼ years from its commencement, till the end of the year 1828,

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The number then surviving and continuing insured, was..... 6930
The number who went out of the Society during their lives, the assurances on them having been discontinued..... 9324

Carry forward 16254

Brought forward 16254
The number who continued assured till death... 5144

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And that the total number of lives insured was 21,398

The most valuable of these data are contained in a table, marked A, of the following form, the ages stated being those last completed:—

Age on admission.	Age 29. Attained the above age.	Living Jan. 1, 1829, at the above age.	Assurances discontinued.	Died.	Age 30. Attained the above age.	Living Jan. 1, 1829, at the above age.	Assurances discontinued.	Died.	Age 31. Attained the above age.	Living in Jan. 1829, at the above age.	Assurances discontinued.	Died.	Age on admission.
25	462	7	32	2	421	10	29	2	380	5	14	5	25
26	481	6	22	2	451	7	26	7	411	7	13	4	26
27	624	10	54	3	557	6	31	5	515	6	29	4	27
28	726	8	40	2	676	7	70	4	595	3	37	4	28
29	783	...	...	3	780	1	45	5	729	7	65	4	29
30	...	...	...	...	762	..	1	2	759	4	36	4	30
31	...	...	...	...	...	...	...	...	785	...	...	2	31

The number in each column on the extreme right and left shows the age at which the lives in the horizontal line passing through it were insured; and each large column, with the age written over it, gives in its four subdivisions the information there expressed for each age of admission separately.

1. The number of lives who attained that over-written age.

2. How many of them were living of that age when the observations terminated.

3. How many went out of the Society alive, by discontinuance of insurance at that age, during the observations.

4. How many of them died insured during the same time.

And as none of the last three descriptions of lives could have entered into the next greater year of age during the observations, while all the rest of the lives of the first description must have done so; if the sum of the 2d, 3d, and 4th numbers be subtracted from the first, the remainder, being the number who entered on the next greater age, is inserted in the first division of the column for that greater age.

The numbers in each horizontal line of the table always begin with the number admitted during the observations at the age of admission standing on the same line in the marginal columns; and the number admitted is placed in the first division of the column with the same age at its head; from which it necessarily follows that the number of lives insured at any age, is always the last number in the first division of the column with that age written over it. Thus, the numbers admitted of the ages 29, 30, and 31, were 783, 762, and 785 respectively. 785, the number admitted at 31, that is, in the 32d year of age, is greater than the number admitted at any other age, which shows that to be the time of life at which assurances were most frequently effected in the Equitable Society previous to the year 1829, and may be taken as a proof that they are most generally wanted at that age, although no such inference could be safely drawn from the records of that or any other office, during a period of twenty years or more, commencing with 1829, on account of the great diversity in the rates of premium required for life assurance by different offices, and in the advantages held out by them, since about 1825 or 1830. The numbers admitted at the four ages 29–32, vary but little. The three first are given in the above specimen of the table, that for the age 32 was 780; they decrease gradually on both sides of that interval of age, so that from the commencement of the 30th to the end of the 33d year of age, appears to be the period of life in which most life assurances are applied for; probably also that in which most first marriages of men are contracted in this country.

There are in the table 70 ages of admission, beginning with 7, and ending with 88; but only ten lives were admitted after completing their 67th year. As the greatest age attained by any life assured, and that by one only, was 94 years completed, there are 88 columns with the ages from 7 to 94 written over them, each divided into four.

Thus, it appears, that in this very valuable table, which had long been wanted before it appeared, and is one of the many important benefits derived by the public from the Equitable Assurance Society; the progress of all the 21,398 lives through the different ages from seven to ninety-four, so long as they respectively remained insured, the respective ages at which they entered the society, and at which they went out of it, whether by death or discontinuance of assurance, are distinctly shewn, and the means of determining the law of mortality amongst the lives are given, even for determining it amongst those separately which were admitted at any one age, so far as their limited numbers will allow. Immediately after this, two other tables, undistinguished for reference either by number or letter, are given; the first exhibiting for each of the four divisions of every column with the age set over it, that age standing in the margin of this table on the same line, the sum of the numbers in that division set against all the ages of admission. The numbers in the first column of this table we consider to be of very little importance in comparison with those in the three other columns; they shew the number of observations of each kind obtained in each year of age, and consequently the different degrees of confidence the rates of mortality derived from them at different ages are entitled to. It shews, that between twenty and seventy-four years of age, the number of observations, or of lives passing into, and in whole or in part through each year of age, was always above 1,000; that number increased from the age of seven where it was forty, to the age of forty-three, where it attained its maximum of 7,725, and then decreased gradually to the age of ninety-four, where there was but one life left which did not reach ninety-five. But the same things were shewn, although not at one view, in table A, where the sum of the numbers in each column standing

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against all ages of admission were given; therefore the numbers in that first column might well have been omitted, and the number of admissions at each age substituted for them; or if the first were retained, a column for the number admitted at each age should have been added, for then that table would have exhibited at one view, and in small compass, all the data necessary for determining the law of mortality.

The other small table merely gives the same information as the first, not for each year of age separately but for the interval between seven and ten, and then for every interval of five years of age between ten and ninety-five years.

A table marked B differs much from A both in its contents and value; it is stated to shew "the duration of the lives of those persons *only* who became members of the Equitable Society between September 1762 and January 1st 1829, and who either continued their assurances to the latter date or died during the intervening period;" all those lives the insurances on which were discontinued, having been omitted. But all of those omitted lives were, while insured in the society, subjected to the chances of mortality equally with the others which continued insured till they either survived the period in which the observations were made or became extinct. By the extract given above from table A, it appears that 783 lives were admited at 29 years of age; but that table shews, that of these, 379 went out of the society during the observations by discontinuance of the assurances on them; the remaining 404 *only* are inserted in table B, as having been exposed to the chances of mortality in that year of age during the observations, and the three deaths which happened in the same year of age, are assumed to have taken place out of 404 instead of 783 persons admitted in the same year of age. The same number, 379 of those admitted at 29 years of age, also went out after the age of 30, which number being taken from 780, leaves 401; 334 of them went out after the age of 31, which, taken from 729, leaves 395; and in this manner table B has been formed from table A. The following extract from table B corresponds with that given above from table A.

Age of admission.	Age 29.		Age 30.		Age 31.	
	Living.	Died.	Living.	Died.	Living.	Died.
25	266	2	257	2	245	5
26	298	2	290	7	276	4
27	340	3	327	5	306	4
28	386	2	376	4	365	4
29	404	3	401	5	395	4
30	...	...	435	2	433	4
31	...	...	...	...	460	2

Let us now consider those lives only which were twenty-nine years of age when admitted, and since the number of deaths among them at that and each of the greater ages was the same according to both tables, whilst the number

attaining the age	29,	30,	31,
was, according to table A,	783,	780,	729,
——— B,	404,	401,	395,

it is manifest that the mortality, at each age according to table B, will be greater than according to table A, in the ratio of the number attaining that age according to table A, to the number attaining the same age according to table B;[1] that is, at these three ages nearly in the ratio of two to one. But the younger the lives are at admission the greater is the proportion of them who leave the society by discontinuance of insurance; and after the lapse of eight or ten years from the age of admission, the number of lives which leave the society in that way diminishes rapidly as the age increases, so that the two tables (A and B) approximate closer and closer as old age comes on, and differ but little after sixty.

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It is also to be borne in mind that the numbers attaining the age of thirty, and dying of that age, are obtained by taking the sum of all the numbers in the first and last divisions respectively of the column in table A with 30 at its head, from seven, the least age of admission, to the age thirty, the mortality in which is the object of inquiry; and the higher in the column any number is, or the less the age of admission, the longer have the lives then thirty years of age been insured, both in table A and B. Hence it is evident that the error in excess of the mortality according to table B in any year of age (thirty for instance) will not be so great as among those lives only which were admitted at that age. And all that is shewn here, with regard to lives admitted at thirty years of age, and attaining that age, applies equally to those admitted at and attaining to any other age.

Those marked C and D are tables of mortality derived from A and B respectively; and two other tables, marked E and F, shew the expectation of life at every age from ten to ninety-seven years according to tables C and D.

After these a valuable table is given, shewing the number of deaths which took place amongst the persons insured in the society during the term of thirty-two years, 1801—1832, in each interval of ten years of age from ten to eighty and those above eighty, by each of forty-three different causes, as certified to the Court of Directors. The whole number of deaths during that term was 4,095, of which there were occasioned

By thirty-seven different diseases....	3,449
Natural decay of age.....	566
Childbirth.....	4
Accidents.....	40
Suicide.....	29
Murder.....	3
Being slain in war.....	4
	4,095

This table shows the comparative numbers of deaths by each disease at different ages, and from different diseases in the same interval of age; but not the rate of mortality from each disease in each interval of age; for this purpose, the annual average number of insured lives existing in the society in such interval of age during that term of thirty-two years is necessary, but unfortunately wanting. Lastly, as a supplement to Table A, a small table is given, showing for the intervals of age between 7 and 10, 90 and 97, and in each interval of 10 years between 10 and 90, the numbers living and dying in each of those intervals of age during each of the four years. Upon comparing the numbers living in the same intervals of age at the end of the year 1828 given in Table A, with those in this supplemental table, we infer that it was at the end of the year placed at the head of the column in this table that the numbers stated in that column were living in those intervals of age. But the only information given on the subject, is the word "Living" placed at the head of the column of numbers.

In the year 1832 was published a compilation in 4to, by Mr. Marshall, entitled, *Mortality of the Metropolis*, containing the London Bills of Mortality to the year 1830 inclu-

[1] Here we omit the deduction shewn in the section on the LAW OF MORTALITY to be necessary for the number of lives entering the society remaining insured when the observations terminated, and leaving it by discontinuance of insurance at each age. To make and to explain it here might perplex some readers, and the false views of the subject table B is calculated to give, are here, we trust, sufficiently exposed without it.

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sive; with various statistical details taken from the enumeration and parish register abstracts of this country, with a few short notices of a similar kind relating to Spain and Portugal, Prussia, the Netherlands and Sweden, but without any distinction of ages, except for Sweden, and even for that population, only the numbers of deaths in the single year 1820, under one year of age, between one and fifteen, and those above fifteen.

Dr. Forbes's very valuable *Sketch of the Medical Topography of the Hundred of Penwith, comprising the district of the Landsend in Cornwall,* already quoted in this article, was published in the second and fourth volumes of the "Transactions of the Provincial Medical and Surgical Association," in the years 1834 and 1836. It is divided into two parts; and it is only the first chapter of the second part, which is contained in the volume of the Transactions published in 1834, that we have occasion to notice here. The progress of the population is first treated of, and the information on that subject is taken from the population abstracts at the four decennial enumerations of 1801–1831; but keeping the mining parishes separate from the agricultural. There are twenty-five small tables; in the first seven, the numbers of marriages, births, and deaths, are given, and compared with those of all England, and with particular parts of it, without noticing the ages of the deceased; but in the eighteen others the number of deaths in each decade of age from birth to a hundred years, and those above a hundred are given. On these Dr. Forbes makes the following observation: "Abstracts of all the registers in the hundred were made by myself, with the utmost attention to accuracy."

The publication of bills of mortality in Paris commenced during the administration of COLBERT, an epoch rendered memorable by so many useful establishments. That great minister proposed to the king to issue an order, that a bill for that city should be printed and published at the end of each month, containing in addition to what is usual elsewhere, the numbers admitted into the hospitals; there were also added short remarks on the character of the seasons, and the principal diseases which had prevailed; with the prices and weights of different kinds of bread, and some other objects of general consumption. The motive of this ordinance was thus expressed: "Estant important au public, pour la santé et pour la subsistance des habitans, d'en connoistre l'estat en tout tems, et d'observer soigneusement les causes qui augment ou diminue le peuple en chacqun des quartiers de Paris, il sera fait, tous les seconds jours du mois, une feuille qui contiendra le nombre des baptesmes, des mariages et des mortuaires du mois précédent et de chacune des paroisses en particulier."

This ordinance was attended to for fifteen years, 1670—1684, but after the death of Colbert, which happened in 1683, it was neglected during twenty-four years, 1685–1708;[1] the publication of the bills was resumed in 1709, and has been continued ever since, improvements having also been introduced into them from time to time.

This information is taken from a "Mémoire sur la Poputation de la ville de Paris depuis la fin du 17e siècle," in the second volume of a great and important work printed by the French Government, but not for sale, entitled, *Recherches Statistiques sur la ville de Paris et le Département de la Seine; Recueil de Tableaux dressés et réunis d'après les ordres de Monsieur le Comte de Chabrol, conseiller d'état, préfet du département.*

The first volume was published in 1821, in small octavo, and contains sixty-three tables; it is stated in the introduction, that lithography was made use of by the administration in the publication of the tables in that volume, to multiply the applications, and to encourage the exercise of that new art; probably this gave occasion to its being used as above mentioned in the large Swedish tables published in 1829. Three other volumes of this work have been published in quarto, with all the tables printed by types in the usual way; the use of tables for digesting and presenting the information collected is continued throughout the work, which, as is justly observed, admits of an immense number of results being brought together, excludes superfluous dissertations, and facilitates all comparisons. Topography, population, institutions, agriculture, manufactures, commerce, and finances; are all minutely detailed in so many separate chapters; but we have only occasion in this article to attend to the population; and on that subject shall notice principally those parts of the work, where the numbers of annual births, and the numbers both of the people and of the annual deaths, with the ages of the living and those at which the deaths took place, are stated.

An enumeration of the inhabitants of Paris was made in February 1817, and in the first volume, where the results of that enumeration are given; there is also given an extract from a report made to the minister of the interior, by the Count de Chabrol, dated the 3d of July 1818, explaining the manner in which it was effected. He states, that attempts had been made on several previous occasions to ascertain the population of Paris by an effectual enumeration; but that different circumstances had contributed to render the results very inaccurate. He gives reasons for which he considers it indispensable to obtain, not only for each house, but for each separate location, a distinct list with the christian and surname of each person of whatever age, the sex, (shown by the christian name), the state of celibacy, marriage or widowhood, and the condition, profession, or occupation of each; he explains minutely the measures that were taken to carry this into effect, and the checks used to ensure a great degree of precision. To avoid including the same person twice in the enumeration, the place of residence chosen for that of inscription was *the habitation during the night*, which rule was always strictly adhered to; to prevent the effects of changes it was desirable to complete the work as quickly as well might be; and in one month and ten days the enumeration of 657,172 persons was made at their places of residence in the manner stated above. This is called *nominative* enumeration.

But a part of the population from their continual change of place, could not be enumerated so correctly. These were foreigners, or native French subjects then resident in the capital, but without any fixed habitation, travellers, the inmates of twenty-seven hospitals,[2] civil and military, of ten prisons, of forty-three military establishments, of six hundred and ninety-two furnished hotels, of divers other establishments, and the persons with regard to whom the information obtained was insufficient; all of these persons are said to be numbered *collectively*, and no distinction is made either of their ages or sexes.

Of the persons enumerated nominatively, the number of each sex separately in each quinquennial interval of age from birth to thirty years completed, then in each decennial interval to a hundred, and of those above a hundred years of age was given. The whole numbers of them of all ages were these:

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[1] As were also those for the three last months of the year 1684; and the bills for 1676 and 1677 are wanting; so that, altogether, there were twenty-seven years from the first publication of the bills, in which their publication was either interrupted or neglected, unless the two missing bills were lost, which is probable.

[2] Under which term we here include les Hospices et les Hôpiteaux.

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Males.		Females.		Both Sexes.
Unmarried..	162,843	Unmarried..	175,210	338,053
Husbands...	128,589	Wives.....	129,596	258,185
Widowers...	13,815	Widows.....	47,119	60,934
Totals....	305,247	...	351,925	657,172
Those enumerated collectively amounted to...				56,794
and made the total population within the walls,				713,966
Adding to this the population of the *Hospice de Bicètre*, and of the *Maison de Retraite de Mont-Rouge*, which, though situated without the walls, belong to Paris.....				3,246
we have.....				717,212

the whole population of Paris on the first of March 1817. An attempt was made to class according to their ages the persons who were only enumerated collectively, the ways in which the different estimates were made, are explained, and a table (No. 7.) of their results is given; but we consider them to be so uncertain, that we are not aware of any useful purpose they can be applied to, and therefore take no farther notice of them here.

It is also observed that the number of the living under five years of age, even in the nominative census, was much less than it should have been in consequence of the very great number of children which are sent to be nursed in the neighbouring villages, both by their parents and by public establishments, neither the mean number of them, nor the mean duration of their absence from Paris, could be ascertained, and any estimates that could be made on the subject were so uncertain that it would have been useless to state them.

The nominative census was also deficient in numbers after fifty years of age, on account of the number of aged poor who die in the civil hospitals. The approximations to the ages in these appear to be entitled to more confidence than in the rest of the collective census, and for those within the walls of Paris they are given in column sixth, whilst the numbers of the nominative census at the same ages are given in column seventh of table seven; and by them we find that the numbers were

In the nominative census.	In the civil hospitals.
At all ages.....657,172	12,596, about $\frac{1}{52}$d part.
Above fifty years of age, 134,104	6,037, about $\frac{1}{22}$d part.

From what has been stated above, it will be evident to those who understand the subject, or who read the next article, that this enumeration, although performed with great skill and labour, does not afford the means of determining the law of mortality in Paris, even if we had the most satisfactory accounts of the numbers of births and of the deaths that took place at all ages.

Paris being for municipal purposes divided into twelve districts called *arrondissements*, distinguished by so many numbers from one to twelve, and each of these into four quarters, Table III. shows for each arrondissement and for each quarter of it (giving also the names of the quarters), the numbers of houses, of families,[1] and of persons, that were ascertained by the nominative census to be in it on the first of March 1817; also for each of the six descriptions of persons separately, mentioned above as those who were numbered collectively, how many persons were so numbered in each arrondissement and in each quarter of it. And in the last two columns of that table, the total number of persons in each arrondissement and in each quarter of it on the first of March 1817, is given; but there is no distinction of age or sex in this table.

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Table IV. exhibits the number of the living ascertained by the nominative census to be then in each of the fourteen intervals of age above mentioned, with the distinction of sex and condition as to celibacy, marriage, or widowhood; the totals of which, omitting the ages, we have stated above.

Table V. shows for every 10,000 persons in each of the twelve arrondissements, how many were in each of the same intervals of age, but without distinction of sex or condition. The following tables to the tenth inclusive, relating to the numbers and proportions of the people, we do not think necessary to notice here particularly; the whole number of the tables relating to the population and extent of Paris is twelve, numbered from three to twelve, and including two as first and second supplements to table ten.

We now proceed to those parts of the work which exhibit what the French denominate the *mouvement*, but we call the *progress*[2] of the population; which is shown by statements of the numbers of annual marriages, births, and deaths, during a series of years, with the ages at which the deaths happened.

The volumes these documents are contained in, and the years in which the events recorded took place, are as follow:

No. of Vol.	Published in the year.	Years reported upon.	
I. 8vo.	1821	2	1817 and 1818
II. 4to.	1823	3	1819 — 1821
III. 4to.	1826	2	1822 and 1823
IV. 4to.	1829	3	1824 — 1826

There are able introductions and memoirs prefixed to all the volumes, which it would not be consistent with the objects of this article to notice further here; except the memoir already mentioned on the progress of the population of Paris during the 17th, 18th, and 19th centuries; which we now resume.

Before 1710 the numbers of foundling infants were, or at least can only now be found, recorded, for the years 1670, 1680, 1690, and 1700; but the publication of the bills of mortality having been resumed in 1709, the number of foundlings was stated in them for 1710, and every following year. The sexes were not distinguished either in the numbers of births, deaths, or foundlings, till the year 1745; after which it was always preserved; it was only from the year 1795 that the numbers of still-born children were recorded separately, and we are not informed whether they were previously included among the births or deaths, or both or neither of them. 1806 was the first year in which the illegitimate children were distinguished from the legitimate; they had previously been put together without distinction. This information is taken from the table in the second volume numbered 53, (and the notes that ac-

[1] The French word is *Ménage*, and to render *family* synonymous, we have, we believe, only to extend its meaning to the case of a single person residing and conducting all his or her domestic affairs alone; whether occupying the whole of a house or only a part of it.

[2] The *movement* or *motion* of the population would be the better term if it were admissible in English, as it applies equally whether the number of the people is increasing or decreasing.

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company it) showing the numbers from the year 1670 to 1821, with the exception of twenty-six years above mentioned necessarily left blank, and another which was defective.

The progress of the population of Paris during each of the ten years 1817—1826, as exhibited in the four volumes above mentioned, is contained in ten tables. In the first six there is no distinction of ages.

The *first* shows the numbers of births, marriages, and deaths, that took place in each month of the year, without reference to place; and then those which took place in each of the twelve arrondissements of Paris, without reference to the months of the year which they happened in; the sexes being distinguished both in the births and deaths.

The *second* shows the same things in greater detail; the columns of the first table being subdivided in this, so as to show how many both of the births and deaths took place at home, and how many in the hospitals; also, of each of these two descriptions of births, how many of the children were legitimate and how many illegitimate.

The *third* is confined to natural children; and with regard to them, the same information is given as to the sexes, and the months and arrondissements in which they were born; but in addition to this, it is shown how many of them were acknowledged at their birth, and how many were not; also how many were acknowledged by celebration of marriage, and how many after birth, before a magistrate.

The *fourth* shows the number of still-born children of each sex, during each month, and in each arrondissement.

The *fifth* shows the number of marriages in each month and in each arrondissement, which were given without further particulars in the first table; but here, the number of marriages in each horizontal line of that table, is shown to consist of four different numbers of so many different kinds of marriages. Thus:

	1	2	3	4	
	Between Bachelors and		Between Widowers and		Total as in Table I.
	Maids.	Widows.	Maids.	Widows.	
The totals in the city of Paris in the year 1826, were,	6457	368	708	222	7755
In the arrondissement of St. Denis,	732	60	83	26	901
Arrondissement of Sceaux,	584	44	77	27	732
Grand Totals in the capital or department of the Seine.	7773	472	868	275	9388
	8245		1143		
	9388				

Hitherto for the sake of perspicuity, we have taken no notice of the rural arrondissements of Saint Denis and Sceaux; but we add them here, to show the way in which the numbers for them are introduced in all the first six tables, after the totals for the city of Paris are obtained; and by adding them to the totals for the city, the grand or general total is also obtained for the whole of the capital, or department of the Seine. The last four of the ten tables relate to the city of Paris only.

The *sixth* shows the deaths in each month and arrondissement, the same as the first; but each column in the first table is so divided in this, as to show how many of each sex died at home, also how many in the civil, how many in the military hospitals, and how many in prisons. In this and the first table of deaths, the dead bodies deposited at the Morgue within the year, are added to the sum of the deaths both in the different months of the year, and in the different arrondissements within the walls of Paris, to obtain the total number of deaths in the city.

The *seventh* table we consider as being the most valuable of the ten. It shows, for the city of Paris only, the numbers of deaths in the first and second quarters of the first year of age, also in the last half, consequently in the whole of that year; then in every following year of age separately, to that of ten years completed; and after that in every interval of five years of age to a hundred, and those above a hundred; always distinguishing the sexes, and showing the numbers who, in each interval of age, died unmarried, married, widowers or widows.

Were it not for the salutary practice of sending children born in Paris into the neighbouring villages to be nursed; as the numbers of births of both sexes are given, and also the numbers of deaths of both sexes separately in minute intervals of age under ten years; the law of mortality among them might be determined, even independent of enumerations of the living. But under the actual circumstances, that very desirable object cannot be attained.

The *eighth* shows the numbers of violent and accidental deaths, voluntary and involuntary, in each of various ways, which took place in the city of Paris in each month of the year, and in the whole year; the sexes being distinguished in each of the numbers for the whole year, but not for each month.

The *ninth* shows the number of suicides attempted during the year, in the department of the Seine; the number of those attempted which were effectuated, and the number of them which were prevented; with the means of destruction employed, and the presumed motives of suicide. The sexes are also distinguished, and the married from the unmarried.

The *tenth* shows the number of deaths from small-pox in each month of the year, and in each arrondissement in the city of Paris, without distinction of age; also the number of them that took place in each of the intervals of age employed in the seventh table, without distinction of months or arrondissements; the sexes being in all these cases distinguished. Then the number of gratuitous vaccinations during the year, in each arrondissement, is shown. The sexes of the vaccinated were distinguished for the years 1817 and 1818, but not afterwards. Each of the two tables here numbered 9 and 10, was, for the years 1817 and 1818, divided into two; so that the number showing the progress of the population in those two years, was twelve instead of ten.

In addition to these, a table numbered 37, in the first volume, is too curious and interesting to be passed unnoticed here. It was formed from extracts made by *M. Benoiston de Châteauneuf* from the statements of deaths prepared in the mayoralties of the different arrondissements; which statements were founded on the declarations made by the physicians and surgeons who certified the deaths.

The table shows, for each of the four years, 1816—1819, the number of deaths produced in the city of Paris, by each of the following pulmonary diseases: Asthmas, catarrhs, defluxions on the chest *(fluxions de poitrine)*, and consumptions *(phthysies)*; in the spring, summer, autumn, and winter of each year, without distinction of age; but also in each interval of ten years of age from birth to seventy years, between seventy and ninety, and between ninety and a hundred; without distinction of seasons. The total by each of these diseases in each of the four years is also

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stated, with the total number of deaths in Paris from all causes during the same year; and the proportion of the mortality from each of those pulmonary diseases to the whole mortality; the sexes being distinguished throughout. No table of that kind, nor of the deaths by other diseases than the small-pox, was inserted in any of the other three volumes. Statements of the annual average progress of the population in each of the arrondissements of Paris during the five years 1817–1821 are given in the third volume, tables 42–50; and for the next following quinquennial period 1822–1826 in the fourth volume, tables 54–62. Table 102 of the second volume shows the comparative riches of the different arrondissements in the city of Paris; it was constructed from the register of personal taxes imposed in the year 1820; that table with the others above mentioned in the first three volumes, were the principal data on which M. Villermé founded his very valuable *Mémoire sur la Mortalité en France dans la classe aisée et dans la classe indigente*, in the first volume of the *Mémoires de l'Académie Royale de Médécine*, tome i. 1828.

In the introduction to the fourth volume of the *Recherches Statistiques* it is stated, that a fifth would terminate the work; and a short account is there given of its intended contents; but in May 1837, when this article was printed, that volume had not appeared.

Statements of the progress of population in Paris and in every department of France, are regularly published in the *Annuaire du Bureau des Longitudes*, also of the population of the different departments, and of their arrondissements and chief towns, but without any notice of the ages. The numbers of deaths in the city of Paris of each sex by the small-pox at the different ages, have also been inserted in the same work, for 1817 and every subsequent year; but not the numbers gratuitously vaccinated.

The ages at which the deaths happened are not given in any of the statements in the *Annuaire*, except those for the city of Paris.

In February 1835 was published at Troyes, the capital of the department of the Aube in France, *Recueil des principaux travaux des Conseils de Salubrité du département de l'Aube*, containing the same kind of information, given in the same manner, but rather more fully respecting the progress of population in Troyes, as is given in the *Recherches Statistiques* for the city of Paris; except that there is no mention made of still-born children, or of the deaths from small-pox, or of the numbers gratuitously vaccinated.

The statements of the deaths in all the intervals of age, are given not only for each year, but for each month of each of the ten years 1821–1830; also in one table, those in each month during the whole term.

These documents were derived from the bills of mortality by Dr. Patin, president of the council for the arrondissement of Troyes.

The population of the place at the commencement of the term was 25,076, at the end of it 23,749, of whom 10,626 were males, and 13,123 females. The ages of the people do not appear to have been distinguished at either of the two enumerations made at the commencement and at the end of the term; neither are the total numbers of the two sexes who were living at its commencement given separately. So that the law of mortality cannot be determined from the data obtained.

The three following tracts relating to the Netherlands, were all published at Brussels in 8vo:

1. In the year 1827 a Memoir on National Statistics, entitled, *Développement des trente et un Tableaux publiés par la Commission de Statistique, et relatifs aux mouvemens de la Population dans les Pays-bas, depuis la creation du Royaume jusqu'a* 1824 *inclus;* par Edouard Smits, *Sécrétaire de la Commission*, &c. &c.

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The tables shew the numbers of persons on the first of January 1815, and on the thirty-first of December 1824, residing in the towns, and in the rural communes separately, for each of the nineteen provinces in the kingdom; with the numbers of them for the whole kingdom of the Netherlands taken together. They also show what the number of the people with the same distinction of town and country residence, was on the first of January in each of those ten years; with their mean number during the first and second halves of that period, and during the whole of the same period; but in these numbers of the people there is no distinction made either of age or sex; the number at the end of 1814 is stated (p. 2) to be *estimated*, and that at the end of each year after it, was found by adding the excess of the births above the deaths in the same year, to the population at the end of the preceding; so that the numbers of the people there stated, are not entitled to much confidence.

The progress of the population is also shewn by statements of the numbers of births, marriages, divorces, and deaths, and the differences between the numbers of births and deaths during each of the ten years for the whole of the kingdom; and for each province during the whole of the ten years, the inhabitants of towns being distinguished from those of the country, and males from females, in all that relates to the numbers of births and deaths. The proportion between the sexes in the numbers both of births and of deaths, and that of the annual births as well as of the annual deaths, and of the difference between them to the whole population, in the towns and the rural communes jointly and separately are given, for the whole term of ten years, the two periods of five years each, and for each year of the whole term.

2. In the same year (1827) *Recherches sur la Population les Naissances, les Décès, les Prisons, les Dépôts de Mendicité, &c. dans le royaume des Pays-Bas*, par M. A. Quetelet, *sécrétaire de la commission de statistique du Brabant-méridional, &c.* M. Quetelet (p. 2) states the population on the 1st of January 1825, to have been estimated at 5,992,666, which falls short of 6,013,478, stated by M. Smits, by 20,812; and that this estimate was founded on two partial enumerations of the people made previously, one under the imperial government, the other about the commencement of the then (in 1827) actual government; and that from these, and the numbers of annual births, the estimate was made in the manner proposed by Laplace.[1] He states that the data they then (in 1827) had, could only be considered as provisional and wanting rectification. There is little more in this tract that we can properly notice here, as it is chiefly on subjects not within the scope of this article; but the note A at the end, by M. Le Baron de Keverberg, contains some good observations on enumerations of the people.

3. In 1832, *Recherches sur la reproduction et la mortalité de l'Homme aux differens ages, et sur la Population de la Belgique*, par MM. A. Quetelet et Ed. Smits, *(premier recueil officiel)*. An enumeration of the people in Belgium was made in November and December of the year 1829, but owing to the partial occupation of the provinces of Limburg and Luxemburg, the information obtained respecting them, especially the latter, was incomplete. The whole number of the people on the 1st of January 1830 was found to be 4,064,209, of whom 998,118 were resident in towns, and 3,066,091 in the rural *communes*. The people were throughout classed according to their residence in town or country, their sexes, and their state of celibacy, marriage or widowhood.

The authors state (p. 13) that in the tables of enumera-

[1] *Théorie Analytique des Probabilités*, p. 391, and *Essai Philosophique sur les Probabilités*, p. 45. It was first adopted by the French government in 1802.

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tion the ages of the inhabitants were carefully specified; but although we consider this to be of much more importance than any other part of the inquiry, the information they have given on this subject is far from being satisfactory. In every other place of any considerable magnitude where this important and laborious operation has been performed; in Sweden, Spain, Carlisle, Paris, Great Britain, Glasgow, and Philadelphia, a distinct statement of the *absolute* number of persons found to be in each interval of age at the time of the enumeration has been published; and in some cases, as in those of Carlisle, Paris, and Glasgow, the manner of proceeding and the checks employed to ensure a considerable degree of accuracy have been explained. But in the case of Belgium, all information of this kind has been withheld, and the authors have only given us (p. 16) a table shewing the *relative* numbers of the people in the different intervals of age. For every million of them it shews for each sex separately, and for each of forty-seven ages from birth to one hundred years inclusive; how many were above that age, and also how many of these were in a state of celibacy, marriage, or widowhood.

Although the professed object of the authors was to treat of the mortality at the different ages of human life, they have given their readers no information whatever as to the ages at which the deaths took place; nothing in the form of bills of mortality, nor any abstracts from them; they merely state that the data from which they formed the table of mortality they have given (p. 36), were carefully collected during three years from the civil registers of the kingdom.

A very valuable memoir, the result of more than two years' labour, entitled *Recherches Historiques et Statistiques sur la Population de Génève, son mouvement annuel et sa longévité, depuis le* 16me *siècle jusqu'à nos jours* (1549—1833), by M. Edouard Mallet, was read to the *Société de Physique et d'Histoire Naturelle* of that city on the 18th of November 1834. It is divided into three parts; the first contains all that is known of the population of Geneva, and the successive enumerations of its inhabitants from the sixteenth century to the present time, with some details respecting the extent of the place, its habitations, its climate, and the industry of its inhabitants. The second exhibits the progress of the population from the commencement of the registers in Geneva, in December 1549, to the restoration of the republic at the end of December 1833, a period of 164 years, especially the meritorious but hitherto unpublished labours of Drs. Cramer and Joly; the progress of the population is given year by year, viz. for the deaths from 1549, for the marriages and births from 1693; and some theoretical inferences are drawn respecting the different elements of this population, the continual increase of its longevity and decrease of its fecundity. The third part presents the detailed results of the progress of population in Geneva during the twenty years 1814–1833, from the restoration to the end of the latter year. The necessary length of this memoir prevented the whole of it being published in the second part of the seventh volume of those above mentioned; he therefore gave in that place the third part of it only, but not even that without omitting an explanation of the steps he took in making, himself, extracts from the registers, to render them available for useful purposes. This third part being the result of his own labour, and containing new facts and discussions relative to the progress of the population during that term of twenty years, 1814–1833.

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The above is nearly a literal translation of the short preface to that part; although read to the society in November 1834, it was not published till the end of the year 1836; and the whole of the memoir, including what was omitted in the first publication of the third part was inserted in the *Annales d'Hygiène Publique*, No. 33, (being tome xvii. *prem. partie*,) which appeared in January 1837.

M. Mallet shews, that at a remote period the legislature of Geneva considered an exact knowledge of the population of the city a matter of importance, and he has given it at nine different periods of enumeration; the first in the year 1589, when it was 13,000, the last in 1834, when it was 27,177, of whom 12,573 were males and 14,604 females; at the same time the population of the suburbs was 9052. In these enumerations the administration took no account of the numbers of locations or of families, nor of the proportions of the people in the states of celibacy, marriage or widowhood; neither do they appear to have taken any account of the ages of the people at any of the enumerations, which is much to be regretted, as that information would have greatly enhanced the value both of the enumerations and of the extracts from the registers of births, deaths and marriages; it would have enabled us to determine the law of mortality in Geneva, which has not yet been done, although repeatedly attempted and thought to have been effected satisfactorily.

The deaths are certified by a visiting surgeon, who gives an account of them every week to the hospital where the civil registers are kept; and it is from his statements that the general mortuary registers are formed. The births, marriages and deaths that take place in the suburbs are entered in the registers with those of the city till 1791 for the marriages and births, and till 1805 for the deaths. Since 1799 for the marriages, and since 1806 for the births and deaths, those only for the population of Geneva within the walls are stated. The population of the suburbs has seldom been ascertained or stated with that of the city. In the registers of births and deaths the sexes are always distinguished; the abortive and still-born are stated separately; but before the year 1814, at which period M. Mallet took up the bills twenty years afterwards, as in too many other bills of mortality, they were also added to the number of deaths, properly so called, which took place among the living, and were therefore likely to be included among them by incautious or unskilful persons in calculating the rate of mortality.

The mortuary registers of Geneva, as M. Mallet remarks, have been the object of a great and laborious work, which the celebrated economist M. D'Ivernois has lately discovered by chance.[1] This work, the fruit of immense researches in the old registers, for a period reaching so far back as the

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[1] The author of this article happened accidentally to contribute to this. In his letter of the 20th March 1834, to Sir Francis D'Ivernois, he requested information respecting the extracts from the mortuary registers of Geneva made by the late Dr. Cramer, which M. Duvillard, in his work on small-pox and vaccination, stated were communicated to him by Dr. Butini; also respecting the labours and publications of Dr. Odier, and others there mentioned, p. 105. In answer, M. D'Ivernois was so obliging as to favour him with three letters dated respectively the 2d and 16th of April, and the 17th of May of that year, with satisfactory information as to where the publications of Dr. Odier on the subject are to be found. In the first is the following passage: "Quant aux ouvrages, ou plutôt aux notes du Dr. Cramer ce n'étaient que des notes manuscrites qu'il laissa à sa mort à son ami le Dr. Butini lequel les communiqua dans le temps à M. Duvillard." In the second; "J'en profite aussi pour vous remercie d'une découverte bien *précieuse* que vous m'avez fait faire en me demandant les ouvrages du Dr. Cramer, son petit neveu le C. Cramer, vient de découvrir dans les papiers de famille un manuscrit qui est surement sans parallèle nulle part, rien moins que près de 200 tables de mortalité tenues année par année, et avec une exactitude remarquable pour Génève ville depuis l'origine de nos registers jusqu' en 1768." The third was accompanied by a printed half-sheet, in 8vo, being *Proposition de M. D'Ivernois, lu au Counseil Représentatif dans la séance du lundi* 12 *Mai* 1834, in which he mentions the results of Dr. Cramer's labours as "consigné dans un manuscrit qu'un heureux hazard m'a fait découvrir depuis quelques semaines seulment." That third letter commences thus:

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year 1549, and which, from 1560, when their representation of the progress of the population became regular, to the year 1760, contains no less than 115,777 deaths classed according to the ages at which they happened, was performed by Dr. Jean-Antoine Cramer. Periodical recapitulations and general tables give the results to the year 1760; Dr. Cramer continued the bills of mortality from that year till his death in 1775, and left then a continuation of them to the year 1770 inclusive. It was only from the year 1560 that the ages of the deceased were stated in the registers, and they were omitted during the twelve years 1568–1579, as were also those of 1648 individuals who died of the plague in 1615 and 1616.

Dr. Abraham Joly continued the inquiries of Dr. Cramer in the same manner during forty-one years, 1771–1811, and died himself in 1812.

Dr. Louis Odier published, in the *Journal de Génève*, for 9th July 1791, and in the *Bibliothèque Britannique*, for 1797, a *General view of the Mortality at Geneva*, which is nothing more than an abridged reproduction of Dr. Cramer's tables, but unfortunately left it to be inferred that they were the results of his own labours, and that was the impression produced.

But the most important work of M. Odier was a continuation of the labours of M. Cramer for the last forty years, 1761–1800, of the last century, and the first thirteen (1801–1813) of the present.

The other authors who have laboured in the same field of research, besides M. Mallet himself, are MM. De Candolle-Boissier, Serre, Dr. H. Lombard, M. Heyer.

Among many other useful and interesting tables, M. Mallet gives one which shews the progress of the population by giving the number of births, marriages, and deaths for each year, from 1549 to 1813, both inclusive, in the second part of his work; those for the next following period of twenty years in the third part.

We have here given a very imperfect account of this able memoir, which we consider highly creditable to the author's judgment and taste; almost all we have taken from it here is nearly literal translation, as we felt that we could hardly do otherwise without doing worse. Those who take interest in the subject will no doubt refer to the original, which, by being printed in the *Annales de Hygiène*, is easily accessible. We had gotten together the materials for a more lengthened notice of the labours of M. Odier, gathered from the *Bibliothèque Britannique*, but the opportune appearance of M. Mallet's memoir induces us rather to refer to it.

In M. Mallet's account of his own inquiries into the state of the population and mortality during the twenty years 1814–1833, we have the fullest information on every point, in the same manner and to the same extent for Geneva, as it has been given for Paris, in the *Recherches Statistiques;* but whilst these are generally confined to mere tabular statements of numbers and their proportions, with as few observations on them as can well be avoided; M. Mallet accompanies his tables with observations, reasonings, references to other authors, and the results of calculations very clearly stated, that greatly increase their value. As instances of the way in which he shows the uses of his tables, and assists his readers in drawing inferences from them, which will become much more interesting and instructive by being compared with those drawn in the same way from other tables of a similar kind; we give the two following statements: after a table showing the numbers of births of males and females separately, in each of the twenty years, and for the whole term; also distinguishing the legitimate from the illegitimate, he gives the following

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Proportion of the sexes.

Boys...	5678	— 51·9725	— 100	— 108·21	— 13.
Girls...	5247	— 48·0275	— 92·39	— 100	— 12.
	10·925	100·0000			

M. Mallet justly observes, that the proportion of boys to girls in the births at Geneva, is high in comparison with other places, and higher there in the present than in the last century, when M. Cramer estimated it to be 18:17; whilst in France since the restoration, it has been 17:16. He also states, that "M. Poisson a fait remarquer qu'il y a dans la proportion des sexes une différence notable entre les enfans légitimes et les naturels: chez ceux-ci, les naissances des filles se rapprochent plus de celles des garçons que chez ceux-la. M. le Professor Prévost a même donné une explication, si non tout-à-fait satisfaisante, du moins très-ingénieuse de ce phénomène. La plus grande proportion des mâles dans les naissances légitimes n'est nulle part plus frappante qu' à Génève. En effet, on trouve:

Legitimate	Boys...	5128	— 52·151	— 100	— 108·99
	Girls...	4705	— 47·849	— 91·75	— 100
		9833	100·000		
Illegitimate	Boys...	550	— 50·366	— 100	— 101·48
	Girls...	542	— 49·634	— 98·54	— 100
		1092	100·000		

M. Mourgue, however, had stated the numbers of births of both sexes separately, with distinction of the legitimate from the illegitimate, in the first part of his valuable memoir on the progress of population in Montpellier, published in the *Mem. de la Soc. Roy. de Médécine, ann* 1780 *et* 1781; and the whole of the memoir was read at a meeting of the French National Institute as above mentioned in 1795; but he made no remark on the difference in the proportion of the sexes between the legitimate and illegitimate births. Mr. Milne in his *Treatise on Annuities*, published in 1815, (article 789) has stated the proportion of the sexes at birth for several places at different times and under various circumstances; with distinction of the legitimate from the illegitimate in Sweden and Finland, and in Montpellier; he also there expressed his opinion, confirmed by subsequent observations, that the difference depends principally upon the age of the parents; the younger the parents, the nearer the proportion of the numbers of their male and female children at birth approaching to equality. What the connexion is, between the cause and effect, is a curious and interesting problem, which has not yet been solved that we are aware of.

In Wales the pressure of the population upon the means of subsistence in a way suited to the wants and habits of the people, is such as, notwithstanding their great disparity in civilization and refinement, to produce great similarity

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"Voici un discours dont je vous dois l'hommage car le première idée m'en est venue à la suite des renseignmens que vous m'aviez demandés sur le Dr. Cramer, et qui m'ont fait découvrir dans la poussière d'une grenier le recueil non interrompu de 200 tables de mortalité pour Génève. Il m'a paru mèriter d'être mis en evidence. Mais voilà tout ce que je puis vous envoyer des œuvres de ce modeste ecrivain."

We perfectly agree with M. Mallet in the opinion expressed by him in a note supporting it, from which the following is extracted: "Le travail de M. Cramer a été attribué à M. Odier par divers auteurs, MM. Prévost, Serre, D'Ivernois, Lombard. Pour rendre à chacun ce qui lui est dû, je dois dire qu'il est démontré à mes yeux, que le relevé mortuaire de 1560 à 1760, appartient en propre a M. Cramer. Le beau manuscrit qui le renferme est tout entier de la main de M. Cramer, comme je m'en suis assuré en le comparant à la signature du docteur, dans la registre de la faculté de médécine de Génève. A l'epoque où s'arrête les tables de recapitulation de M. Cramer en 1760, M. Odier n'avoit encore que 12 ans."

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between the inhabitants of the principality and those of Geneve *intra muros*, in the proportion of the annual marriages to the population, and of the sexes at birth; which M. Mallet appears not to have been aware of. Whence we *infer* a similar resemblance in the advanced age of marriage, and the small average number of children to a marriage (in Geneva during these 20 years $2\frac{3}{4}$); the very defective state of the British registers of births rendering them of no use in this inquiry, except in determining the proportion of the sexes at birth, for which they may be used, as, however defective these registers may be, there is no reason to suppose they are more so for one sex than the other.

During the years.	No. of persons to one annual marriage.	No. of males born for every 100 females.
In Wales.		
1811 — 1820	141·636	109·500
1821 — 1830	143·039	110·916
1811 — 1830	142·334	110·207
In Geneva.		
1814 — 1833	141·593	108·990
In England.		
1811 — 1830	121·342	104·277

Dr. Casper's *Contribution to Medical Statistics*,[1] was published at Berlin in 8vo in 1825; it is divided into three parts: the first treats of suicide and its increase in our time; the second, of the poor and of the sick poor in Paris; the third, of the mortality among children in Berlin. The last part contains a variety of tables shewing the numbers of births in different years, distinguishing the legitimate from the illegitimate, and of the deaths that took place among them under fifteen years of age. The numbers of deaths by small pox, and a few other diseases of children, (but not each of those others separately,) both before and after the introduction of vaccination, are given; but no mention is made of their ages, and we need not notice them farther here.

A second volume by the same author was published at Berlin in 8vo in 1835 with two title pages, one being the same as that of the work above mentioned, published ten years before, with the addition of "vol. ii.;" the other, *An Inquiry into the probable Duration of Human Life amongst different classes of the people*.[2]

The second volume contains a great many tables in the text, and seventeen at the end; most of them copied from other works, but some that appear to be original; of which, those most material to notice here, are, 1st. The number of deaths in every year of age, from birth to 104 years completed, of males and females separately, which took place in Berlin during the twelve years 1818–1829, amounting to 36,895 males, and 32,467 females, of both sexes 69,362; these are given in his table of mortality for Berlin at the end of the work, numbered II. 2d. A table given in the text, (p. 106), showing the number of deaths that took place in Hamburg during the seven years 1819–1825, without distinction of sex, in the first and second years of age separately, then those between 2 and 5 and between 5 and 10; after that in every decade of age from 10 to 90, and those above 90 years of age. But the numbers of the people in the different intervals of age not being given in either of those cases, any tables of mortality constructed from the numbers of deaths alone, at the different ages, can be of no value.

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In vol. i. part 1, of *The Transactions of the Statistical Society of London*, recently published, there is *A statistical view of the births and deaths in the Prussian States, during the fifteen years* 1820–1834, translated from the German of M. Hoffman, Director of the Statistical Bureau in Berlin, the numbers of births and deaths, with distinction of the sexes, and the mean number of the people without that distinction during that term of fifteen years are given; also the number of deaths during the same term, with distinction of the sexes, between birth and one year of age completed, between 1 and 3, 3 and 5, 5 and 7, 7 and 10, and then in each quinquennial interval of age to 90, and those above 90. But the intervals of age into which the people were distributed in the Prussian enumerations appear never to have been sufficiently minute to admit of their being available for determining the law of mortality. There is a good deal of interesting information in this paper; but the above is all we can with propriety notice here; especially as the translation must be easily accessible to most of our readers; and throughout this article it has been our object to give the most minute accounts of such interesting publications as, to many readers, may be difficult of access; that those who take interest in them may see whether it may be worth their while to procure the perusal of them; and also to assist others in perfecting similar labours which they may be engaged in.

In the first volume (which is statistical) of the work of the Baron of Sedlitz, *On the power of the Prussian Monarchy under Frederic William III.*[3] there is given (p. 284) for each of the seven years 1816–1822, including the military but excluding the inhabitants of Neufchatel, the number of inhabitants of the kingdom, the number of marriages, the whole number of births, and the number of illegitimate births separately, also the number of deaths; but without distinction of age or sex. He also gives the number of inhabitants for two of these years under 14 years of age, between 14 and 60, and above 60, which, however, are included in the statistical view of M. Hoffman.

One of the best bills of mortality we have seen, is prepared by the Board of Health at Hamburg, and published under the name of a Table of Mortality, covering all the four sides of a large folio sheet; and consist in fact of five tables regularly numbered.

I. The first shows the total number of interments and the daily average number, also the total number that took place at each of fifteen different burying places, during each month of the year separately, and during the whole year; without distinction of age or sex.

II. The second shows the same during each month for the abortive and still-born separately; then the deaths properly so called, which took place amongst the living, during each of the four quarters of the first year of age, in the second year, between the ages of 2 and 5, and of 5 and 10 years, then in each decade of age to 100, and those above 100; with the total for each month and for the whole year, of each sex separately, and for both sexes without distinction. There is also a column set apart for those whose ages were not known.

III. The third table consists of two parts, both of which are abstracts from the second; the first showing for each month the number of the abortive and still-born, and also of the deaths under and above ten years of age. The second,

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[1] Beiträge sur medecinischen Statistik und staatsarzneikunde.

[2] Die wahrscheinliche Lebensdauer des Menschen, in den verschiedenen bürgerlichen und geselligen verhaltnissen, nach ihren bedingungen und hemmnissen untersucht vom Dr. J. L. Casper.

[3] Die Staatskräfte der Preussischen Monarchie under Friedrich Wilhelm III. 1ster band. Berlin, 8vo, 1828.

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besides the number of abortive and still-born, shows the number of deaths in each of the above-mentioned intervals of age. The sexes are distinguished throughout.

IV. The fourth table, besides the abortive and still-born, shows the number of deaths of each sex, and of both without distinction, that took place within the year, both under and above ten years of age, by about eighty different causes, besides those by suicide in various ways, and other violent deaths.

V. The fifth table shows the number of children born in each month of the year, and during the whole year, both alive and dead at birth, with distinction of the sexes of those born alive, but not of the others; that, however, is given for them both in the 2d and 3d tables; the number of twin and triple births are also stated in separate columns.

The only fault we see in this bill of mortality, which, in in other respects, may well serve as a pattern for others, is the most improper practice of including the abortive and still-born children in the totals both of the births and the deaths; they should always be stated, but kept separate, both from those born alive, and from the deaths that took place among the living. The distinction of the legitimate from the illegitimate births with that of their sexes, would also be an improvement, if it could well be made; but we consider it to be much more curious than useful. The author is only in possession of one of these Hamburgh bills, which is for the year 1836. The totals were as follow:

Births.	Males.	Females.	Both sexes.
Abortive and prematurely still-born[1]	85	56	141
Still-born at the full time	96	81	177
Totals	181	137	318
Born alive	2109	1951	4060
Deaths	2138	1837	3975

No attentive reader can fail to be struck with the difference (so ill understood) in the proportion of the sexes among the three kinds of births; those born alive, the still-born, and the abortions. This bill is but for a single year, but the same kind of difference prevails generally; and can hardly be contemplated by a philosophical mind without exciting curiosity and the desire of further information as to the difference between the sexes, first, in the difficulty of fully entering upon life, and afterwards in retaining it, more strongly marked, as we approach nearer to the period of conception.

In October 1836 appeared, in the 32d number of *Annales d'Hygiène* (tome xvi. part 2), *Considérations Statistiques sur le Royaume de Naples*, addressed to the Royal Institute of France by Dr. Salvatore de Renzi, in which he shews why the population of the kingdom, and consequently the rate of mortality among the people, could not be determined previous to the year 1818. He gives four tables. The first shews for each of the sixteen years 1818–1833, the number of the people, and the numbers of births and deaths which took place among them, in each of the fifteen provinces of the kingdom separately, without distinction of the sexes, and without including Sicily, being able, he states, to assure his readers of their exactness and precision during that period being incontestible.

The number of inhabitants in 1818 was 4,990,380, and at the end of 1833 it was 5,883,273. In his second table, he gives for each of the provinces, and for the whole of the kingdom, the proportions of the annual average numbers of births and of deaths to the number of the people. The following are a few of them:—

Province.	No. of inhabitants out of which one was born annually.	No. of inhabitants out of which one died annually.
Capitanata,	M. 21	26
Principato citra,	m. 29	m. 48
Abbruzzo ultra, 1°,	m. 29	45
—— ultra, 2°,	28	43
—— citra,	24	M. 21
The whole kingdom,	25	36

M. set against a number denotes that the mortality or fecundity is there a *maximum*, and m. that it is a *minimum*, not of those above mentioned only, but of all the provinces in the kingdom. The third table shews in what proportions 1000 inhabitants, and the fourth in what proportions 1000 deaths were, in each province separately, and in the whole kingdom taken together, distributed into the following intervals of age:—between birth and one year completed, between 1 and 8, 8 and 19, 19 and 26, 26 and 41, and those above 41 years of age.

A bill of mortality is published annually for the city of Naples, which contains most of the information contained in other bills of that kind; but is defective in one important point, the statement of the ages at which the deaths took place, those of the inhabitants are not even mentioned, which indeed is too common elsewhere. It states the number of the people at the end of the year it reports upon, and also at the end of the preceding year. The sexes are always distinguished in the enumerations of the people, as well as in the births and deaths; the legitimate are also distinguished from the illegitimate births; the number of twin births, with the sexes, are stated, and how many of them were pairs of boys, how many of girls, also how many of the pairs were children of different sexes; as was also done by M. Mallet and M. Hoffman, in their statements for Geneva and the Prussian states respectively.

The numbers of immigrants into and emigrants from the city, are stated, distinguishing native Neapolitan subjects from those of foreign states; the number of marriages contracted is given, but without any information as to the ages or previous conditions of the contracting parties. The number of deaths at home, and those in the hospitals and other public establishments are stated separately. The proportions also are always stated: as of the births, deaths, and marriages to the population, and of the annual births to the contemporaneous annual marriages, but not minutely; they are expressed in vulgar fractions, instead of decimals, having always the same denominator, as 100 or 1000, which is a great fault. No information is given as to the ages of the people, and the deaths are only stated in the following intervals of age:—between birth and 1 year completed, between 1 and 11, between 11 and 18, 18 and 26, 26 and 41, and those above 41. The only bill for the city of Naples in the author's possession is for the year 1822; it was inserted in the *Giornale del Regno delle due Sicilie*, of the 8th of February 1823. The population at the end of 1822 was 344,716, of whom 163,059 were males, and 181,657 females; at the end of 1821 the number of inhabitants was 341,143. The total number of births in 1822 was 14,233; of deaths, 12,195. The number of deaths in 1822 at ages above 100 years, was 17, and of the deceased 6 were males, and 11 females; the names, residences, and ages of them all are stated; they were all citizens of Naples but three, who came respectively from Procida, Salerno, and Venice, which last, Rosa Romanzo, was the oldest of all, having at-

[1] *Unzeitige und frühzeitige todtgeborne*, that is, untimely and early still-born, by which we presume are meant, the abortive which had never *quickened*, to use a more common than well defined term, and those which died between the time of quickening and the full period of gestation.

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tained the age of 107; three other ladies attained each to the age of 104.

In the same Journal, for the 23d of April 1823, a bill of mortality for the city of Palermo during the year 1822, compiled by Dr. Francesco Calcagni, is given. The number of inhabitants at the end of 1821 is stated to have been 160,051, and at the end of 1822, 161,735; but this last was derived from the first number, only by adding to it the excess of the births above the deaths during the year 1822. No useful information is given as to the ages of the deceased, and this bill is in other respects inferior to that for Naples; it differs from that, and all others we have seen, in tracing persons born out of wedlock to their graves, whatever age they may attain, and distinguishing the legitimate from the illegitimate in the numbers of deaths as well as of births. In 1822 the number of deaths of the legitimate was 4476, of whom 2294 were males, and 2182 females; that of the bastards, as they are called, was 418, of whom 151 were males, and 267 females. Of the illegitimate children born in that particular year, 256 were boys, and 307 girls. Out of the 4894 deaths, 16 of the deceased are stated to have attained ages from 97 to 105 years; but no information is given as to the distribution of those 16 persons into or among those last nine years of age.

For these two Italian bills of mortality, the author is indebted to Mr. W. R. Hamilton, who was so good as to send them to him from Naples, when they were published; and he is happy to avail himself of this opportunity to acknowledge his obligations to that gentleman, for the facilities he has afforded him of procuring information from abroad on other occasions.

Of all the statements derived from bills of mortality and enumerations of the people, which we have mentioned, only those for Sweden and Finland, Dr. Heysham's for Carlisle, and Dr. Cleland's for Glasgow, have been given in the proper form, and with sufficient correctness to afford the information, which is the most important object of them all, viz., that which is necessary for determining the law of mortality.

To effect this, it is only necessary to know the mean number of the living and of the annual deaths, in sufficiently small intervals of age, throughout the extent of life, for a period of time sufficient to allow of the accidental fluctuations arising from more or less fruitful years, and other causes, compensating each other: such periods, probably, should not be less than eight or ten years; but the necessary length will depend upon the climate, the number of the people, their general modes of life, and their political circumstances.

These *data* being obtained, it is not difficult to determine the proportion of the annual deaths to the number of the living in each year of age. Then, assuming any number of births, as 1000 or 10,000, it is easy to show how many would die in each year of their age; and, consequently, how many would survive that year; which numbers of survivors and of annual deaths, when arranged in the order of the ages, constitute the desired table of mortality, by which all the most important questions respecting the duration of human life may be easily resolved.

For want of understanding the principles upon which the proper construction of such tables depends, most of the writers on this subject, many of them men of great merit and industry, have taken much pains to little purpose, and after excessive labour, have arrived at false conclusions. Hardly any of them appear to have been aware of the necessity of obtaining the number of the living, as well as of the annual deaths in each interval of age, or that that would greatly enhance the value of Bills of Mortality, by extending their useful applications.

Dr. Price's *Essays on the proper Method of constructing Tables of Mortality*, already mentioned in this article, was intended to show how such tables might be constructed from registers of the *deaths only* at all ages; but the hypotheses he proceeded upon can hardly obtain in any real case; and even if they did, his method would only determine the number of the living in the place, at every age; therefore, if it could be put in practice (which it never can), it would only supersede the necessity of actual enumerations; and, with the numbers so obtained, we should have to proceed as above.

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That *Essay* of Dr. Price was an amplification of what Mr. Simpson had previously advanced on the subject, with his accustomed accuracy, and contains many just observations on the defects of the tables of mortality that had previously been published; but so far as it contributed to induce a belief that the determination of the number of the living in every interval of age, by actual enumeration, was not necessary to the construction of accurate tables, it must have done harm.

What is here stated will be found demonstrated in the third chapter of Mr. Milne's *Treatise on Annuities*.

It is desirable that a bill should be published for each year separately, to show how the rates both of mortality and fecundity, vary with the circumstances of the people in different years; and, from these yearly bills, nothing is more easy than to derive others for longer periods.

According to the form A, the births of both sexes in each year will be distinguished, and the born alive from the still-born; the number of marriages will also be given.

In this, and all other cases where those who undertake the formation of such bills are either unable or unwilling to distinguish all the particulars indicated, the reasons for the omissions should be inserted in the spaces set apart for the numbers omitted. The number of still-born children should always be stated separately, and should never be included in the number either of the births or deaths with those who had lived and breathed.

The numbers of deaths of the two sexes in each interval of age, during any year, may, as they are collected from the registers, be conveniently disposed according to the form B; the intervals between five years of age and an hundred, being each five years; and the number dying at each age above an hundred should be particularly specified.

But some persons, who would not take the trouble of forming bills of mortality in which the ages are to be so minutely distinguished, might yet be willing to furnish them with the requisite care, according to the form b, which might still be very useful; and, indeed, from twenty to sixty years of age, intervals of ten years each might do very well.

The value of Bills of Mortality would be greatly enhanced, by inserting in them the contemporaneous wages of labourers in agriculture, and of the workmen employed in the more common kinds of trade and manufacture carried on among the people they relate to; also the prices of the necessaries of life which persons of these descriptions consume the most of; together with any thing uncommon in the seasons or the crops, and every material change in the circumstances of the people.

Enumerations.

The number of the people in the several intervals of age, which we have stated above to be of so much importance, may be disposed in tables exactly similar to B or b, recommended for the deaths; but it is not necessary that the duration of life should be divided into the same intervals for the living as the dead. It is always desirable that the intervals should, in both cases, be small; but yet not so small, as, by the increase of labour, to occasion the numbers being determined with less exactness, or to deter many from engaging in the work. Such intervals should not, however, exceed ten years.

When the bills are given for a certain period, if there be

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but one enumeration of the people, it should be made at the middle of the period; if two, at its extremities; and if more than two, it is desirable that they should be made at equal intervals of time throughout the period.

We give no forms here of Bills of Mortality and Fecundity, designed to distinguish legitimate from illegitimate children, or the mortality or fecundity of each month of the year, nor the number of women delivered annually at the different periods of life, nor the diseases the deaths were occasioned by. Neither are the forms here recommended for enumerations of the people, calculated to distinguish the numbers in the different states of childhood, celibacy, marriage, or widowhood; nor the ranks, or professions, or occupations of the people. All these things are curious, and of some use, although, if we except the diseases which the deaths of each sex at the different ages were occasioned by, they are of little value in comparison with the information the forms here given are calculated to convey. And it is of so much importance that that information should be given correctly, that we would willingly forego these minor objects, to avoid dividing and fatiguing the attention of those who undertake the more important part of the task, which is of itself sufficiently laborious.

And those who may be disposed to keep registers, and form bills and enumerations, on a scale so much extended as to include all these particulars, or most of them, and have also the requisite qualifications, will find no great difficulty in preparing the most convenient forms of tables for the purpose. Several forms of that description, with references to others, will be found in Mr. Milne's *Treatise on Annuities*, and in many other works referred to in this article.

A.

During the year 18 .	Males.	Females.	Both.
Born alive.....	449	431	880
Still-born.....	13	9	22
Whole number born....	462	440	902

Number of Marriages, 261.

B.

	Between the							Ages of			
	0 & 1	1 & 2	2 & 5	5 & 10	10 & 15	15 & 20	20 & 25	90 & 95	95 & 100	above 100	Totals.
Males..	210	152						7	4	0	881
Fem.....	180	149						18	10	2	959
Both....	390	301						25	14	2	1840

b.

	Between the Ages of												
	0 & 5	5 & 10	10 & 20	20 & 30	30 & 40	40 & 50	50 & 60	60 & 70	70 & 80	80 & 90	90 & 95	95 & 100	above 100	Totals.
Males..	417	42									7	4	0	881
Fem...	395	47									18	10	2	959
Both...	812	89									25	14	2	1840

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The first, second, and fourth of the following tables are good examples of that kind; but for insertion of the deaths of children, we prefer the intervals of age between one and two, and between two and five, to those used in the Swedish tables, viz. between one and three, and between three and five; because the greatest mortality prevails at the earliest ages; and that from small-pox is greatest in the first year of age, while the mortality from measles is greatest in the second year. It is, therefore, desirable to have the means of comparing the rates of mortality in the first and second year of age in registers kept both before and after the prevalence of vaccination.

Information on the diseases and mortality of children is highly desirable; and as their ages at death can generally be stated correctly, if accurate registers were kept of the numbers born alive, and of the numbers of annual deaths at all ages, with the causes of them, the rate of mortality amongst children at every age might thence be determined, and even that produced by each of the principal diseases at each age. It will be seen by our account of the Parisian *Recherches Statistiques*, or by the *Annuaire du Bureau des Longitudes*, that the numbers of deaths of children are given for Paris in much more minute intervals of age than is usual in this country; and by the *Jaarboekje* of M. R. Lobatto, published at the Hague, that for Amsterdam, and also by the *Annuaire de l' Observatoire de Bruxelles*, by M. A. Quetelet, that for that city, they are given in intervals of age still more minute than for Paris. This indeed is the case for more advanced ages, but we consider it as being there of less importance.

The expression we have adopted of the interval of age in which any lives were prolonged, or in which any deaths took place, we consider as at once the most simple and free from ambiguity; yet it has been stated to be ambiguous, an opinion which we conceive can only be held by those who do not clearly comprehend the exact import of the expression. We therefore trust we shall be excused for giving an explanation here, of what we thought could have required none.

The age of every individual being the time that has elapsed since the moment of birth, is at that moment nothing; we therefore express it by 0; and whatever portion we assume for the unit of time, whether an hour, a day, week, month, or year, the age at the expiration of that time from birth will be exactly one such portion; and all individuals of a less age than that, may be properly stated to be between the ages of 0 and 1. Except in infancy, one year is generally taken for the unit of age; a man at the moment of the 25th anniversary of his birth, is precisely 25 years of age, and until the 26th anniversary, he is between the ages of 25 and 26, or, in other words, in his 26th year; although, it being sufficient for common purposes, he is usually stated to be 25 years of age till he attains 26. At the 30th anniversary of the moment of birth, he will be precisely 30 years of age, but cannot continue of that or any other age during any assignable portion of time, however small. So that at the moment a man is enumerated amongst the living, or dies, the probability of his being precisely of any one age that can be expressed by a whole number of years, is infinitely small; and he may always with the greatest strictness and propriety be stated to be between two such ages. Thus, in the case last mentioned, of a man who has attained the 25th anniversary of his birth but not the 30th, he may be properly stated to be between the ages of 25 and 30.

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TABLE I.

Showing the number of the people in Sweden who were in each of the under mentioned intervals of age, at the end of each of the four years, 1805, 1810, 1820, *and* 1830.

1805.			Between the Ages of.	1810.		
Males.	Females.	Total.		Males.	Females.	Total.
32,591	32,505	65,096	0 and 1	33,821	33,342	67,163
60,435	60,945	121,380	1 — 3	52,006	52,650	104,656
57,100	57,436	114,536	3 — 5	53,741	54,439	108,180
123,547	122,850	246,397	5 — 10	120,157	120,295	240,452
121,946	120,767	242,713	10 — 15	118,711	117,954	236,665
105,016	107,896	212,912	15 — 20	112,241	114,644	226,885
96,072	104,481	200,553	20 — 25	92,534	106,073	198,607
91,427	98,236	189,663	25 — 30	85,065	97,104	182,169
76,675	85,189	161,864	30 — 35	82,641	91,589	174,230
72,516	81,966	154,482	35 — 40	68,454	76,515	144,969
70,116	78,810	148,926	40 — 45	65,434	75,753	141,187
61,845	69,239	131,084	45 — 50	61,056	69,913	130,969
57,012	64,790	121,802	50 — 55	54,173	63,155	117,328
43,692	51,551	95,243	55 — 60	47,040	55,700	102,740
34,077	41,149	75,226	60 — 65	35,227	44,184	79,411
23,394	31,679	55,073	65 — 70	23,671	30,390	54,061
16,606	23,647	40,253	70 — 75	15,014	20,382	35,396
9,000	13,076	22,076	75 — 80	8,480	12,311	20,791
3,903	6,087	9,990	80 — 85	3,399	5,371	8,770
1,053	1,746	2,799	85 — 90	937	1,711	2,648
235	371	606	90 — 95	184	310	494
38	49	87	95 – 100	18	51	69
4	7	11	above 100	4	7	11
1,158,300	1,254,472	2,412,772	Total.	1,134,008	1,243,843	2,377,851

1820.			Between the Ages of.	1830.		
Males.	Females.	Total.		Males.	Females.	Total.
37,079	36,052	73,131	0 and 1	40,983	40,132	81,115
67,287	67,287	134,574	1 — 3	79,054	79,407	158,461
64,873	64,974	129,847	3 — 5	72,528	72,812	145,340
130,351	131,518	261,869	5 — 10	170,878	169,870	340,748
115,187	115,626	230,813	10 — 15	145,150	145,247	290,397
115,465	116,868	232,333	15 — 20	130,368	132,925	263,293
110,730	114,758	225,488	20 — 25	107,122	110,585	217,707
105,308	111,270	216,578	25 — 30	106,353	110,261	216,614
88,115	97,691	185,806	30 — 35	102,105	106,088	208,193
77,979	87,492	165,471	35 — 40	93,658	100,661	194,319
73,443	83,021	156,464	40 — 45	76,441	87,263	163,704
57,873	66,806	124,679	45 — 50	64,762	76,528	141,290
53,463	63,969	117,432	50 — 55	58,901	70,808	129,709
46,413	57,715	104,128	55 — 60	43,507	54,435	97,942
37,409	48,001	85,410	60 — 65	36,505	48,958	85,463
28,438	38,206	66,644	65 — 70	28,246	39,092	67,338
17,469	24,436	41,905	70 — 75	18,765	27,008	45,773
8,334	12,251	20,585	75 — 80	10,459	16,028	26,487
3,157	5,151	8,308	80 — 85	3,934	6,794	10,728
911	1,699	2,610	85 — 90	1,009	1,824	2,833
167	362	529	90 — 95	164	362	526
22	58	80	95 – 100	27	62	89
2	4	6	above 100	2	11	13
1,239,475	1,345,215	2,584,690	Total.	1,390,921	1,497,161	2,888,082

TABLE II.

Shewing the annual average number of deaths that took place in each of the undermentioned intervals of age in Sweden during each of the five quinquennial periods undermentioned.

Between the ages of	During the years 1806–1810.			During the years 1811–1815.			During the years 1816–1820.			During the years 1821–1825.			During the years 1826–1830.			Between the ages of
	Males.	Females	Total.	Males.	Females	Total.	Males.	Females	Total.	Males.	Females	Total.	Males.	Females	Total.	
0 and 1	8443	7104	15547	8345	6958	15303	8209	6754	14963	8316	6887	15203	9125	7563	16688	0 and 1
1 — 3	3514	3323	6837	3256	3078	6334	3048	2735	5783	2798	2550	5348	3164	2883	6047	1 — 3
3 — 5	1647	1564	3211	1164	1130	2294	1144	1096	2240	1001	975	1976	1279	1218	2497	3 — 5
5 — 10	1949	1774	3723	1213	1168	2381	1205	1099	2304	981	954	1935	1350	1222	2572	5 — 10
10 — 15	1179	1023	2202	740	687	1427	615	592	1207	548	549	1097	647	606	1253	10 — 15
15 — 20	1030	979	2009	741	753	1494	673	675	1348	567	578	1145	636	626	1262	15 — 20
20 — 25	1288	1014	2302	980	855	1835	905	851	1756	830	691	1521	940	760	1700	20 — 25
25 — 30	1228	1095	2323	949	859	1808	886	852	1738	909	779	1688	1142	881	2023	25 — 30
30 — 35	1213	1158	2371	1063	1012	2075	871	893	1764	953	831	1784	1355	1052	2407	30 — 35
35 — 40	1234	1213	2447	1084	1042	2126	1025	1057	2082	933	876	1809	1418	1143	2561	35 — 40
40 — 45	1386	1370	2756	1178	1085	2263	1134	1055	2189	1153	965	2118	1477	1176	2653	40 — 45
45 — 50	1567	1390	2957	1386	1142	2528	1139	989	2128	1180	896	2076	1609	1230	2839	45 — 50
50 — 55	1881	1736	3617	1597	1399	2996	1422	1294	2716	1253	1033	2286	1716	1411	3127	50 — 55
55 — 60	1951	1887	3838	1684	1629	3313	1565	1498	3063	1461	1314	2775	1645	1508	3153	55 — 60
60 — 65	2103	2276	4379	1931	2020	3951	1819	1920	3739	1668	1744	3412	1966	2060	4026	60 — 65
65 — 70	1857	2175	4032	1811	2090	3901	1827	2120	3947	1686	1885	3571	2045	2346	4391	65 — 70
70 — 75	1835	2322	4157	1604	2011	3615	1683	2087	3770	1692	2002	3694	2034	2527	4561	70 — 75
75 — 80	1506	2106	3612	1218	1645	2863	1177	1548	2725	1209	1573	2782	1640	2243	3883	75 — 80
80 — 85	924	1378	2302	775	1150	1925	713	1085	1998	707	1001	1708	957	1386	2343	80 — 85
85 — 90	378	619	997	303	511	814	310	510	820	269	443	712	322	561	883	85 — 90
90 — 95	}	...	...	75	156	231	66	136	202	76	152	228	72	156	228	90 — 95
95 – 100	} 93	187	280	...	1	1	15	30	45	11	31	42	15	37	52	95 – 100
above 100	}	...	...	...	...	...	1	3	4	2	3	5	1	5	6	above 100
Total...	38,206	37,693	75,899	33,097	32,381	65,478	31,452	30,879	62,331	30,203	28,712	58,915	36,555	34,600	71,155	...Total.

M. Leyonmarck observes that "the mortality during the five years, 1806—1810, was greater than it is stated in this table, owing to the lists of those who died in the service during the war, not having been so accurately made out as they ought to have been."

In the table sent to the author, from which the above has been copied, the average number of each sex in each interval of age was given in years and tenth parts of a year; and that given here in each case is the nearest whole number, whether greater or less; the difference is obviously of no importance.

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TABLE III.

Shewing the number of Deaths that took place in Sweden from each of the causes, and in each of the years under mentioned.

Year.	Child-birth and mis-carriage.	Small Pox.		Measles.		Scarlet Fever.		Hooping Cough.		Putrid Fever.	
		Males.	Females	Males.	Females	Males.	Females	Males.	Females	Males.	Females.
1806	646	745	717	219	227	18	18	2274	2772	1369	1328
1807	657	1013	1116	251	249	35	30	1194	1435	860	898
1808	643	920	894	1275	1211	102	84	276	287	6088	5371
1809	648	1219	1185	825	749	201	191	313	315	5792	5711
1810	700	425	399	163	157	48	42	435	523	4535	4473
Total,...	3294	4322	4311	2733	2593	404	365	4492	5332	18644	17781
Average,...	658·8	864·4	862·2	546.6	518·6	80·8	73	898·4	1066·4	3728·8	3556·2
1811	761	337	361	140	161	During these ten years Scarlet Fever was not separated from other fevers.		987	1155	3578	3626
1812	672	215	189	136	113			1630	1828	1050	1051
1813	532	265	282	344	289			953	1174	3418	3195
1814	580	161	147	2096	2107			461	551	619	595
1815	636	250	222	885	883			532	642	636	575
Total,...	3181	1228	1201	3601	3553			4563	5350	9301	9042
Average,...	636·2	245·6	240·2	720·2	710·6			912·6	1070	1860·2	1808·4
1816	606	343	347	240	186			792	839	473	458
1817	644	125	117	243	234			947	1123	863	867
1818	649	138	167	229	241			598	747	1564	1509
1819	624	80	81	772	784			810	991	2536	2356
1820	647	71	72	1614	1515			709	823	469	468
Total,...	3170	757	784	3098	2960			3856	4523	5905	5658
Average,...	634	151·4	156·8	619·6	592			771·2	904·6	1181	1131·6
1821	695	22	15	3426	3498	88	88	1363	1627	499	531
1822	736	3	8	318	332	118	125	1149	1301	467	447
1823	694	21	18	169	140	100	91	681	673	89	85
1824	534	348	270	190	175	178	172	723	790	324	312
1825	567	685	558	162	161	125	103	1043	1228	128	117
Total,...	3226	1079	869	4265	4306	609	579	4959	5619	1507	1492
Average,...	645·2	215·8	173·8	853	861.2	121·8	115·8	991·8	1123·8	301·4	298·4
1826	601	357	268	209	187	191	165	1477	1584	195	200
1827	569	294	306	245	201	187	202	1244	1477	80	67
1828	673	133	124	2061	1874	369	370	979	1138	108	79
1829	718	34	19	3062	2933	110	111	1031	1053	68	60
1830	623	58	46	285	239	70	59	1015	1130	86	82
Total,...	3184	876	763	5862	5434	927	907	5746	6382	537	488
Average,...	636·8	175·2	152·6	1172·4	1086·2	185·4	181·4	1149·2	1276·4	107·4	97·6

TABLE III. (CONTINUED).

Year.	Infants stifled in Bed.		Murdered.				Executed according to law.		Suicide.				Drowned.		By various other casualties.	
			Children.		Adults.				By ardent spirits.		In other ways.					
	Males.	Females	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1806	209	237	1	4	18	1	0	1	13	1	57	26	659	95	431	150
1807	173	182	1	3	15	2	4	1	18	1	69	21	691	128	479	145
1808	196	218	19	7	19	11	3	2	10	2	54	34	541	136	510	165
1809	169	172	4	3	18	8	3	2	6	1	48	16	495	102	515	162
1810	190	157	5	4	23	2	3	3	20	0	62	12	615	113	451	145
Total,...	937	966	30	21	93	24	13	9	67	5	290	109	3001	574	2386	767
Average,	187·4	193·2	6	4·2	18·6	4·8	2·6	1·8	13·4	1	58	21·8	600·2	114·8	477·2	153·4
1811	192	189	4	3	26	4	10	4	19	0	70	29	756	153	444	116
1812	232	229	13	5	12	3	6	0	10	1	53	23	568	119	389	146
1813	186	158	5	3	11	4	8	2	3	0	58	21	631	146	441	140
1814	185	183	3	4	12	3	4	3	15	1	74	34	618	137	438	118
1815	166	188	5	4	20	3	6	3	13	4	60	15	636	124	406	113
Total,...	961	947	30	19	81	17	34	12	60	6	315	122	3209	679	2118	633
Average,	192·2	189·4	6	3·8	16·2	3·4	6·8	2·4	12	1·2	63	24·4	641·8	135·8	423·6	126·6
1816	199	221	4	3	23	3	8	1	20	1	87	22	643	156	449	127
1817	203	167	7	5	17	4	3	1	13	0	96	27	670	167	421	129
1818	178	136	4	3	20	8	12	3	18	1	102	27	652	147	422	120
1819	152	143	8	2	25	16	5	0	8	0	95	16	819	144	402	149
1820	170	151	8	3	22	4	14	3	16	0	117	21	714	136	450	127
Total,...	902	818	31	16	107	35	42	8	75	2	497	113	3498	750	2144	652
Average,	180·4	163·6	6·2	3·2	21·4	7	8·4	1·6	15	0·4	99·4	22·6	699·6	150	428·8	130·4
1821	203	178	8	9	29	8	4	1	42	3	114	35	802	144	609	226
1822	175	177	5	5	30	13	7	1	25	2	113	40	1059	174	500	176
1823	224	204	7	9	23	9	8	3	38	5	119	32	876	184	499	157
1824	174	191	3	4	30	2	5	1	28	5	122	30	1000	205	514	205
1825	218	197	7	3	32	2	6	3	33	9	115	35	1006	179	574	134
Total,...	994	947	30	30	144	34	30	9	166	24	583	172	4743	886	2696	898
Average,	198·8	189·4	6	6	28·8	6·8	6	1·8	33·2	4·8	116·6	34·4	968·6	177·2	539·2	179·6
1826	181	181	4	6	25	4	10	1	31	2	138	33	1039	177	568	158
1827	162	168	10	3	23	3	12	4	21	2	115	29	741	151	506	160
1828	197	187	6	3	19	9	14	0	47	3	158	34	980	169	617	167
1829	250	251	10	6	29	5	11	2	50	12	154	27	797	136	635	154
1830	212	197	13	4	30	4	14	5	39	7	153	42	836	151	546	150
Total,...	1002	984	43	22	126	25	61	12	188	26	718	165	4393	784	2872	789
Average,	200·4	196·8	8·6	4·4	25·2	5	12·2	2·4	37·6	5·2	143·6	33	878·6	156·8	574·4	157·8

In the copy received by the writer of this article, the deaths from ardent spirits were put between the drowned and the other casualties; and the diseases were not arranged in the order in which they stand here.

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TABLE IV.

Shewing the number of Persons who died in the Kingdom of Norway in each of the undermentioned intervals of age during the term of Nine years which commenced with 1824, *and ended with* 1833.

Between the ages of	Males.	Females.	Both sexes.
0 and 5	38,362	32,500	70,862
5 — 10	3,753	3,349	7,102
10 — 20	4,377	3,964	8,341
20 — 30	6,589	5,694	12,283
30 — 40	6,645	6,602	13,247
40 — 50	6,725	6,431	13,156
50 — 60	8,378	7,569	15,947
60 — 70	11,023	11,753	22,776
70 — 80	11,744	14,501	26,245
80 — 90	6,396	9,134	15,530
90 — 100	1,024	1,761	2,785
above 100	52	102	154
at all ages, ...	105,068	103,360	208,428
The numbers, in the same time and place, of children born alive, were.....	181,712	172,784	354,496
Stillborn,.....	...	...	11,438
Thus it appears that the excess of the number born alive above the number of deaths, was	76,644	, 69,424	146,068

II.—MORTALITY, LAW OF.

The Law of Human Mortality is that which determines the proportion of the number of persons who die in any assigned period of life, or interval of age, out of a given number of persons who enter upon the same interval; and, consequently, the proportion of them who survive that interval.

Tables showing how many out of a great number of children, as 10,000, or 100,000, born alive, die in each year of their age; and, consequently, how many complete each year; exhibit this law through the whole extent of life, and are called *Tables of Mortality*.

This section is divided into three parts. In the *first*, we deliver the history of this branch of knowledge, with as much brevity as appears to be consistent with the chief object, which is that of conveying correct and useful information.

In the *second part*, we demonstrate the whole theory by common arithmetic.

In the *third part*, a new table of mortality is given, constructed on the principles previously explained; some observations are made on the comparative merits of the different tables that have been published; which were purposely omitted in the historical part, when the tables they relate to were mentioned, to avoid discouraging such readers as might not be previously acquainted with the theory; and the faults are explained, which render most of those tables really of no use, since others, more correct, have been constructed.

Part I.—*History.*

The first table of mortality was constructed by Dr. Halley, from the Mortuary Registers of Breslau, for five years ending with 1691; and was inserted in his paper on the subject in the *Philosophical Transactions* for the year 1693, with many judicious observations on the useful purposes to which such tables may be applied.

No further information of this kind was communicated to the public, until William Kersseboom of the Hague published there three tracts on the subject (in 4to.) The first, dated March 1, 1738, was entitled, *Eerste Verhandeling tot een Proeve om te weeten de probable menigte des volks in de provintie van Hollandt en Westvrieslandt.* The second, dated May 15, 1742, *Tweede Verhandeling bevestigende de Proeve om te weeten de probable menigte des volks in de provintie van Hollandt en Westvrieslandt;* and the third, dated August 31, 1742, *Derde Verhandeling over de probable meenigte des volks in de provintie van Hollandt en Westvrieslandt.*

A good account of the first of these tracts has been given by Mr. Eames, in the *Philosophical Transactions* for 1738; and rather a meagre one of the other two, by Mr. Van Rixtel, in the same *Transactions* for 1743. It is therefore unnecessary to repeat here, any thing contained in those accounts; but as they give no satisfactory information concerning the construction of Mr. Kersseboom's table of mortality (which he called a *Table of Vitality*), it will be proper to supply so material a defect in this place.

In his first tract, the author informs us that he constructed his table from registers of many thousand life-annuitants, in Holland and West Friesland, which had been kept there from 125 to 130 years previous to the date of his publication; and showed how many of the nominees, or lives the annuities depended upon, were, at the time of their nomination, under one year old, between one and two, between two and three, and so on for all ages.

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An exact account was also kept of the age at which each life of every class failed; whence it clearly appeared, what degree of mortality prevailed at every age above one year. But because very few children were nominated at or near their birth, he could not, from these registers, determine the mortality under one year of age. He therefore had recourse to mortuary registers and other observations; from exact accounts of which he found, with sufficient certainty, as he says, that out of 28,000 born alive, 5500 died under one year. He also informs us, that, for this purpose, he made use of the observations of divers learned men in England and elsewhere, especially Major John Graunt's, upon the number of the people and the rate of mortality; and upon taking an average of the whole, he found it to differ but little from that just stated.

And this appears to be the only ground for the assertion made by most writers on this subject (probably copying from each other without having seen the original work), that Kersseboom's Table of Mortality was constructed from observations made upon annuitants in England as well as in Holland; also, that it was formed partly from observations made upon the inhabitants of some Dutch villages.

He first published his Table of Mortality in his second Tract, and in his third, he gave abstracts of the registers from which it was constructed. These were contained in twenty-nine tables, twenty-two of which were for the two sexes separately; in the rest the sexes were not distinguished; and the ages at which the lives failed were generally given to the exactness of half a year.

The numbers of lives, whose current year of age at the time of their nomination was given precisely in these tables, were,

Males separately	1843
Females separately	1769
Males and Females, without distinction of sex	1536
Total	5148

And none of these nominees were above twelve years of age at the time of their nomination.

These, however, are only specimens of M. Kersseboom's labours. He says there were so many lives in the registers, that he had not the courage to undertake extracting the necessary particulars for more than 50,000 of them; and in that, he was greatly assisted by his friend Thomas von Schaak. Of all the lives, not more than 1 of 120 was past 55 years of age at the time of nomination.

Nicholas Struyck, in his *Aanhangsel op de Gissengen over den staat van het Menschelyk Geslagt, en de Uitreekening der Lyfrenten*, published at Amsterdam in 1740, at the end of the quarto volume, commencing with his *Inleiding tot de Algemeene Geographie*, gave, from registers kept at Amsterdam for about thirty-five years, two tables of observations made upon the duration of the lives of 794 males, and 876 female annuitants separately; and two tables of mortality he had constructed from them for the two sexes; both beginning with five years of age. These two, taken together, differ but little from that of Dr. Halley; they represent the mortality to be considerably greater than Kersseboom's: having been constructed from so few observations, they are not entitled to much confidence, and appear to have been very little known or attended to.

This work of Struyck gave occasion to the publication, in the same year, of a small tract in quarto, by Kersseboom, entitled, *Eenige Anmerkingen op de Gissengen over den staat van het Menschelyk Geslagt*, &c. wherein he accused Struyck of plagiarism, with but too much appearance of justice.

Neither Kersseboom nor Struyck gave any information as to the manner in which they formed their tables of mortality from the observations on which they were grounded. M. Kersseboom informs us, that he submitted his table to Professor S'Gravesande, some years previous to its publication, and obtained his approbation of it for calculating the values of annuities on lives.

In the year 1742, Mr. Thomas Simpson, in his *Doctrine of Annuities*, (see the article ANNUITIES) gave a table of mortality for London, being the same that had previously been constructed by Mr. Smart, at twenty-five and all the greater ages, but corrected at all ages under twenty-five years, on account of the greater number of strangers who settle in London under that age, which occasioned, till the commencement of the present century, a constant excess of the burials above the births. This correction Mr. Simpson made by comparing together the numbers of christenings and burials; and observing, by means of Dr. Halley's table, the proportion between the mortality in London and Breslaw above twenty-five years of age.

In 1746, M. Deparcieux published (at Paris in 4to,) his *Essai sur les Probabilités de la durée de la Vie Humaine*, in which he gave six new and valuable tables of mortality; one of them constructed from the lists of the nominees in the French Tontines, principally those of the years 1689 and 1696, and the rest from the mortuary registers of different religious houses; four of these showing the mortality that prevailed amongst the monks of different orders, and the fifth, that which obtained amongst the nuns in different convents of Paris. Those for the monks and nuns, with the exception of the tables of Struyck, mentioned above, were the first ever constructed for the two sexes separately.

The *Essay* of M. Deparcieux is written popularly, and with great perspicuity; he has given the most satisfactory accounts both of the *data* his tables were constructed from, and the manner of their construction.

In his thirteenth table, he included with the five tables of mortality of his own construction; that of Mr. Smart for London, as corrected by Mr. Simpson, Dr. Halley's, and M. Kersseboom's, together with the expectation of life *at*, or its average duration *after* each age, both according to his own and M. Kersseboom's table for annuitants, and for every fifth year of age according to each of the other tables; the fractional parts of a year being always expressed in months, and not in decimals.

Dr. Halley first, and Struyck after him, had given the *probable duration of life* after several ages, according to their respective tables, that is, the term at the expiration of which, the persons now living at any proposed age, will be reduced by death to one-half their present number.

But Deparcieux appears to have first given the *average duration of life* after any age, and showed how to calculate it correctly from tables of mortality. On account of the scarcity and value of M. Deparcieux's *Tables of Mortality*, Mr. Milne has reprinted them, with the expectations of life just mentioned, in his *Treatise on Annuities*, with a short account of their construction; it is therefore unnecessary to pursue the subject further here.

In 1760 M. Deparcieux published (at Paris in 4to) his *Addition à l'Essai sur les Probabilités de la durée de la Vie Humaine*, with five tables; three of them relating to life annuities deferred on a peculiar plan, we consider to be of no interest or value at this time: the two others are tables of mortality constructed from statements of the numbers of deaths that took place at different ages, without knowing the numbers of the living at the same periods of life. He obtained the data for the first of them from a clergyman on the frontiers of Normandy and Perche, whose accuracy in all he undertook, he could rely upon; and who gave him the names of the parishes from the registers of which he had extracted the information; but strictly enjoined him not to disclose his name in the event of his making use of

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the documents. In these the sexes were not distinguished.

The other table of mortality M. Deparcieux constructed from statements sent to him by M. Wargentin of the numbers of deaths of males and females separately, which took place in the different intervals of age in Sweden and Finland, during the three years 1754, 1755 and 1756. Those two tables have the same faults as others constructed from similarly defective data; and we consider them to be of no value.

M. Deparcieux states, (p. 28) that in 1744, he suggested to M. Aubert, the commissary who at that time prepared the Bills of Mortality for Paris, the expediency of distinguishing the sexes in the columns of births and deaths, which had not been done previously, but was in consequence of this commenced with the year 1745, and has been continued ever since, as we have already observed in our account of the Parisian *Recherches Statistiques*.

M. de Buffon, at the end of the second volume of his *Histoire Naturelle*, published in 1749, inserted a table of mortality that had been constructed by M. Dupré de Saint Maur, from the registers of twelve country parishes in France, and three parishes of Paris; which M. de Buffon informs his readers that he inserted in his work the more willingly, since these were the only kind of documents, or combinations of them, from which the probabilities of life among mankind in general, could be determined with any certainty. Yet this was a very faulty table, and the numbers of annual deaths were so injudiciously distributed, according to the ages, that it often represented the mortality in one year of age to be three or four times as great, and in some cases, six times as great, as in the next year. Some remarks of M. Kersseboom on this table may be seen in the *Philosophical Transactions* for 1753. M. de Saint Cyran corrected some of its most obvious errors, and inserted both the original and his corrected copy in his *Calcul des Rentes Viagères*. (Paris, 1779, in 4to.)

Mr. Simpson, in the *Supplement* to his *Doctrine of Annuities*, published in 1752, gave some further explanations of the corrections he had made in Mr. Smart's table of mortality for London; and made some very judicious observations on the difficulties that attend the construction of tables of mortality from the mortuary registers only, of large towns.

In the *Nouveaux Mém. de l'Acad. Roy. de Berlin* for the year 1760, there is a paper by the celebrated Euler, entitled *Recherches générales sur la Mortalité, et la Multiplication du Genre Humain*, wherein the subject is treated algebraically. He assumes that the population is not affected by migration, and that the annual births and deaths are always as the contemporaneous population; consequently, that the number of the people increases or decreases in geometrical progression. Then he gives several theorems exhibiting the relations that would obtain between the annual births and deaths and the population, and determines the law of mortality upon these hypotheses, but does not shew how it may be deduced from actual observations independent of hypotheses; neither does he undertake the construction of any table of mortality, but, by way of example, gives that of M. Kersseboom, with the changes of the numbers which become necessary, in consequence of his altering the radix from 1400 annual births to 1000.

Süssmilch took great pains in collecting the numbers of annual deaths in the different intervals of age, which he published in his *Göttliche Ordnung;* and four tables of mortality formed from these *data* are to be found in the same work; that in the second volume (§ 461), which has many imperfections, was formed by himself; the three others, being the 21st, 22d, and 23d, at the end of the third volume, were constructed by his commentator Baumann, according to the more correct method of Lambert.

The first edition of Dr. Price's *Observations on Reversionary Payments*, appeared in 1771, containing his observations on the proper method of constructing tables of mortality from bills which shew the numbers dying annually at all ages, and three new tables of mortality constructed from the London, Norwich, and Northampton bills.

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The second edition of the same work was published in 1772, and contained, in the *Supplement*, much interesting and valuable information which did not appear in the first, together with five new tables, intended to exhibit the law of mortality that obtained, 1st, in the district of Vaud, in Switzerland; 2d, in a country parish in Brandenburg; 3d, in the parish of Holy Cross, near Shrewsbury; 4th, at Vienna; 5th, at Berlin. The first formed from bills of mortality given in the *Mémoire* of M. Muret; and the 2d, 4th, and 5th, from those given by Süssmilch in his *Göttliche Ordnung;* the 3d was from the parish register only of Holy Cross. But we consider none of those tables as now of any value, on account of the defects in the *data* from which they were constructed.

At the end of the first volume of the work of J. H. Lambert, entitled, *Beiträge zum Gebrauche der Mathematik und deren Anwendung*, published at Berlin in 1765, 8vo, he gave a chapter on the certainty of inferences deduced from observations and experiments; and the example with which he concluded the illustration of his theory, was the deduction of the law of mortality in London from the bills of mortality there; by means of a curve, of which the absciss being proportional to the age, the corresponding ordinate was proportional to the number of survivors of the same age.

In the third volume of the same work, published in 1772, the ingenious author treated the subject at much greater length: x being the age, and y the corresponding ordinate to the curve of mortality for London, proportional to the number of survivors of that age out of a given number (10,000) born alive, he gave this equation to the curve,

$$y = 10{,}000 \left(\frac{96-x}{96}\right)^2 - 6176\left(e^{-\frac{x}{13\cdot682}} - e^{-\frac{x}{2\cdot43114}}\right),$$

(e being the number of which unit is the hyperbolic logarithm), which determined the numbers in the table of mortality very near the truth, until 96 years of age, beyond which it was not intended to be used.

M. Lambert also constructed a table by which he intended to exhibit the law of mortality that prevails among mankind in general, from the 23d and 24th tables in the second volume of Süssmilch's *Göttliche Ordnung*, which gave the numbers of deaths, in the different intervals of age, in seventeen country parishes in the mark of Brandenburgh, and from the London bills for thirty years; supposing, with Süssmilch, *(Gött. Ord.* t. i. § 34), that the country people are double the number of those residing in towns.

By an extract of a letter from M. Lambert to Gaeta and Fontana, given in their Italian translation of Demoivre's *Treatise on Life Annuities*, *(Discorso Preliminare*, part iii.), it appears, that all his attempts to find *à posteriori* an equation which should determine the relation between the age and the number of survivors in this last table, proved fruitless; the formulæ he arrived at having been either too long and intricate, or too incorrect. This is the less to be regretted, since there is no doubt that M. Lambert's table did not represent the true law of mortality, as he made no allowance for the effect of the increase of the people by procreation; and it is singular he did not see that that law might be correctly determined from the numbers of the living, and the annual deaths at all ages in Sweden and Finland, given in M. Wargentin's paper in the *Stockholm Transactions* for 1766, which paper he himself quotes.

Lambert appears to have first demonstrated clearly the principal properties of tables of mortality, in doing which he made use of the differential and integral calculus; but

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as he could not determine the equation to the curve of mortality, that resource did not avail him much.

Flourencourt treated this subject algebraically in the third chapter of his *Political Arithmetic*,[1] where he gave a perspicuous view of it, as it had been previously treated by Euler and Lambert; but added nothing himself that was original, except three new tables of mortality; one for males, another for females, and a third for both sexes without distinction; deriving his data in each case from the *Göttliche Ordnung* of Süssmilch. He also gave a new copy of the table of mortality M. Deparcieux had constructed from the registers of the nominees in the French tontines; assuming 10,000 for the radix, and inserting the numbers under three years of age, nearly according to M. Kersseboom's table; this, however, does not differ materially from the original table of Deparcieux.

The fourth edition of Dr. Price's *Observations on Reversionary Payments* was published in the year 1783, and contained new tables of mortality for Warrington and Chester, also for all Sweden and Finland, and for Stockholm separately, in which the sexes were distinguished. Those for the whole kingdom were constructed from enumerations of the living, and registers of the annual deaths, in each interval of age, during twenty-one years; those for Stockholm during nine years. The tables for Sweden and Stockholm were the first ever constructed from the data that are requisite to determine the law of mortality among the bulk of the people, and were sufficiently accurate representations of that law, for the times and places in which the observations were made.

In a paper of M. Henrich Nicander, inserted in the *Transactions of the Royal Academy of Sciences* at Stockholm, for the first quarter of the year 1801, he gave two tables of mortality for all Sweden and Finland, in which the sexes were distinguished, but they were not properly constructed; and the mean duration of life which he gave in them at each age, was very erroneous, especially in early life. In that paper he asserted, without offering any demonstration or proof, that, in what we have called the curve of mortality above, if an ordinate be drawn through the centre of gravity of the portion of the area cut off by the ordinate at any assigned age, on the side of the more advanced ages, the part of the base, or of the axe of the abscisses, intercepted between these two ordinates, will measure the mean duration of life after such assigned age. And the mean duration of life after each age, which he has given, was determined in this manner.

Mr. Milne's *Treatise on Annuities and Assurances* was published in the year 1815; and, in the third chapter of that work, the construction and properties of tables of mortality are fully treated of.

In the second volume of the same work, three new tables of mortality are given; one constructed from very accurate observations made at Carlisle, by Dr. Heysham, who preserved the bills of mortality of the two parishes, which include that city and its environs, and supplied their deficiences with great care, together with correct accounts of two enumerations of the inhabitants, in which their ages were taken; and a table showing the diseases by which the deaths at all ages were occasioned, is also given.

The fourth and fifth tables in Mr. Milne's work, exhibit the law of mortality which prevailed in all Sweden and Finland, both with and without distinction of the sexes, deduced from the registers kept and the enumerations made there, during the twenty years ended with 1795; which term was subsequent to that wherein the observations were made, from which Dr. Price's tables were constructed.

The seventh table in the same work exhibits the law of mortality at Montpellier for males and females separately, and was constructed from the bills of mortality of that place for twenty-one years, ending with 1792.

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The second table at the end of this article, was published in the first edition of it in 1822; the tables of mortality for the lives insured in the Equitable Office, which were constructed by Mr. Babbage and Mr. Davies, were published in 1826; and we have given some account of them as well as of those formed by Mr Finlaison, from observations on Government Annuities in this country, and published in 1829, in the article *Annuities* in this work.

MM. Quetelet and Edouard Smits, in their *Recherches sur la Reproduction et la Mortalité de l'Homme*, in 1832, gave a table of mortality for the towns and the rural districts in Belgium separately, distinguishing males from females, and also for the whole population, without distinguishing the sexes, or the inhabitants of towns from those of the country.

Mr. Morgan, in the above mentioned publication of the Equitable Assurance Society, in 1834, gave a table of mortality for the lives insured in it, (marked C, p. 28), derived from table A of that work; another (D) derived from table B, is not worth a place there.

The second of the tables at the end of Dr. Casper's work on the *Probabilities of Human Life*, published in 1835, was intended to exhibit the law of mortality in Berlin, with distinction of the sexes; it was constructed from 69,362 deaths at different ages; 36,895 of males, and 32,467 of females, which took place there during the twelve years 1818–1829. And M. Mallet at the end of his valuable *Mémoire*, published in 1836, has given one for Geneva, in which the sexes are distinguished: it contains both the mean and the probable duration of life after every age, and was formed from the bills of mortality there for the eighteen years 1814–1833. For males, females, and the two sexes without distinction, M. Mallet took so high a radix as 100,000 births; the number of deaths were, of males 5219, females 5688, of both sexes 10,907; and in the column of deaths, on the same line for any age, as the survivors of that age, the author has put the number of deaths in the registers in the next following year, instead of the decrement of life, or excess of the number attaining that above the number attaining the next greater age, which will probably puzzle many readers.

Part II.—*On the Construction and Properties of Tables of Mortality.*

1. Suppose 10,000 children to have been all born alive at the same instant of time, more than 100 years since; and that the numbers of them who completed and who died in each year of age, were correctly entered in the following table:

Age.	Number who completed that year.	Number who died in their next year.
0	10,000	1,888
1	8,112	453
2	7,659	256
3	7,403	177
4	7,226	130
5	7,096	112
⋮	⋮	⋮
90	49	15
91	34	11
92	23	9
93	14	5
94	9	4
95	5	2
96	3	1
97	2	1
98	1	1

[1] *Abhandlungen aus der Juristischen und Politischen Rechenkunst*, von Carl Chassot de Florencourt. Altenburg, 1781, 4to.

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which, then, would evidently be a table of mortality; and this mode of constructing one, were it practicable, would be the simplest possible.

2. But of 10,000 children taken indiscriminately at birth, it is manifest that the number who complete or survive any year of age, will be just the same, whether they be all born at the same time or not; and, therefore, this table might as well have been constructed by noting the times of the births of 10,000 children taken indiscriminately, and registering the time or the age at which each died; for then, after the whole were extinct, it would only be necessary to collect the sum of those who died in each year of their age, and insert it in the third column of the above table (1) against the proper age. The numbers in the second column would then be obtained by beginning with the 10,000 births, and merely subtracting the number in the third from the number in the second column, and placing the remainder in the next line below, in that second column, throughout the table.

3. It is evident that the number against any age in the second column of such a table, is equal to the sum of those in the third column against that, and all the greater ages; that is to say, that *the number who complete any year of age is equal to the sum of those who die at all the greater ages.*

4. Now let us suppose the population of a place to have remained invariable for one or two hundred years past, during which period 10,000 children have been born alive, at 10,000 equal intervals of time in each year. Also that, there having been no migration, and the law of mortality having been always the same, both the number of the living and that of the annual deaths in each year of age, have remained constant, the whole amount of the annual deaths at all ages, as well as the number of annual births, having been 10,000.

5. Then, if the law of mortality exhibited in the above table (1) be that which obtains in the place just mentioned, that table will represent the stream of life which flows through it, and fills the vacancies left by those who advance in age, or are carried off by death, their successors incessantly following and being followed in the same course.

6. Thus: 10,000 children being born annually at so many equal intervals of time, 7096 will annually complete their fifth year, also at equal intervals; and of these, 112 will die annually in the sixth year of their age.

7. And it is manifest that *the number who annually complete any year of their age in such a place, is equal to the sum of the annual deaths at all the greater ages.*

8. Let us next suppose, that the constant number of deaths which happen annually in any one year of age, take place at equal intervals of age in that year. For instance, that the four deaths which happen annually, in the ninety-fifth year of age, always takes place at the ages of

Years.		Months.
94	.	3
94	.	6
94	.	9

and 95 years; or rather, that the last individual dies at the moment before completing the 95th year.

9. Then the number constantly living in any year of age may be determined as follows:

Let us take, for example, the ninety-fourth year, which 14 persons annually enter upon, and 5 die in. Now, if no deaths happened in that year, it is obvious that the 14 persons who annually enter upon it at so many equal intervals (4 and 6), would be all constantly living at 14 equal intervals of age in that year; and if that year of age were divided into five equal intervals, there would be constantly living in each interval $\frac{14}{5}$ persons; or, in a place similarly circumstanced, but five times more populous, 14 persons.

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But when five deaths take place at so many equal intervals in the ninety-fourth year of age, (the fifth part of a year being 73 days,) the case is altered. Thus,

Lives.	Complete the age of		Number of the living during these last 73 days.
	Years.	Days.	
14	93	73	$\frac{14}{5}$
13	93	146	$\frac{13}{5}$
12	93	219	$\frac{12}{5}$
11	93	292	$\frac{11}{5}$
10	94	...	$\frac{10}{5}$

Or rather, the oldest life that fails in the 94th year, must be considered to expire the moment before completing that year, as only 9 *survive* 94.

But the numerators of these fractions being in arithmetical progression, their sum is equal to half the sum of the first and last terms multiplied by the number of terms; or $\frac{14+10}{2} \times 5$; which sum being divided by the common denominator, 5, we have the number of the living in the 94th year of age $= \frac{14+10}{2}$; an arithmetical mean proportional between the numbers who enter upon the first and last of the intervals which that year of age was divided into.

10. Now, the number, 9, who survive their 94th year, is less only by unit than the number 10, who enter upon the last of the intervals that year was divided into; so that if, instead of $\frac{14+10}{2}$, we take $\frac{14+9}{2}$, or an arithmetical mean proportional between the numbers who annually enter upon, and annually survive their 94th year, for the number constantly living in that year, it will only be less by half a life than what has just been demonstrated to be the true number, according to the hypotheses; and the difference would still have been but half a life, although the radix of the table had been 10,000,000 instead of 10,000; the number of the living would, in that case, according to these two methods, have been 1200 and 1199½. And the number of the living in any one year of age, even according to the above table, is generally several thousands, so that this difference, which remains always the same, is quite immaterial.

Besides, it is obvious that the above hypotheses can never coincide exactly with the facts. And the above reasoning is evidently applicable to any other year of age.

11. We are therefore authorised to conclude, that in a place, circumstanced as above stated, *the number of the living in any year of their age is an arithmetical mean proportional between the numbers who annually enter upon, and who annually complete that year.*

12. Thus it appears that

The number of the living in their	Is half the sum of
94th year,	14 and 9,
95th —	9 — 5,
96th —	5 — 3,
97th —	3 — 2,
98th —	2 — 1,
99th —	1 — 0.

But it is to be observed, that the same numbers occur in

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the first of these two series as in the second, except the first term of the first, and the last of the second, which are 14 and 0 respectively. Therefore the sum of the second of these two series falls short of the sum of the first by 14, the number who annually complete their 93d year; so that the series of half sums falls short of the sum of the first series by 7, the half of 14. And this reasoning will apply equally to any other age than that of 93 years.

13. Whence it follows, that in a place circumstanced as we have supposed, *the number of persons constantly living at any assigned age and upwards, is less than the sum of those who annually complete that and all the greater ages, by half the number who annually complete that year of their age.*

14. From the supposition that the number of persons who die annually in any one and the same year of age, expire at so many equal intervals of age in that year (8), it follows, that for each of these lives which fails before the middle of that year of age, there will be another which will fail just so much after it, and, consequently, that the average quantity of existence during any year of age, for the lives that fail in it, is just half a year.

15. But in taking, for any one year of age, the sum of the numbers in the second column of the table (1) at all the greater ages, each life is counted once for every complete year it survives, after the age first mentioned; and if, to the sum of these, we add half the number in the same second column against that first mentioned age, this half number being the sum of the fractional parts of a year, by which the whole of these lives survive the last year of age they complete (14); the sum total thus obtained will evidently be the whole duration of life after the age first mentioned, enjoyed by all the lives that survive that age in any one year.

16. Therefore, if this last sum total be divided by the number who annually survive that first mentioned age, the quotient will be *the mean duration of life after that age* which is also called *the expectation of life at the same age*, being the portion of future existence which an individual at that age may reasonably expect to enjoy.

17. But, by No. 13, it appears, that the last mentioned sum total is also the number constantly living in the place, at and above the age first mentioned (15).

18. Whence, and from No. 16, it follows, that if the number of the living in the place at any age and upwards, be divided by the number who annually complete that age, the quotient will be the mean duration of life after the same age.

19. And, consequently, if the number constantly living at all ages, be divided by the number of annual births, the quotient will be the mean duration of life from birth, or the expectation of life of a child just born.

20. Hence also it appears, that the number of years in the expectation of life at any age, is the same as the number of living persons at that age and upwards, out of which one dies annually.

21. Thus, for example, the expectation of life at 40 years of age being 25·495 years, the proportion of the living in the place aged 40 years and upwards who die annually, is one of 25·495, or, which is the same, 1000 out of 25,495.

22. The numbers represented by a table of mortality to die in any intervals of age, are called *the decrements of life* in those intervals.

23. And the interval between any age and the utmost extent of life, according to any table of mortality, is called *the complement of life* at that age, according to the same table.

24. If the decrements of life be supposed to be equal and uniform through its whole extent, and the interval between birth and the utmost extremity of life be divided into as many equal parts as there are annual births, then, one of the individuals born will die at the expiration of each of these equal intervals of age; and the numbers who survive the several intervals, from birth to the extremity of life, will form an arithmetical progression.

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25. Whence it will be found (11), that the number of the living at any assigned age and upwards, will be equal to the number who annually complete that age, multiplied by half the number of years in the complement of life at the same age.

26. And if this last product be divided by the number who annually complete that age, the quotient, that is, half *the complement of life, will be the expectation of life at that age* (18).

27. The mean numbers of annual deaths at all ages, or, which in this case is the same, the number of deaths in each year of age, that take place during any one year, in a place circumstanced as we have supposed, being given, a table may be constructed as follows, which will answer all the most interesting questions that can be put respecting the population and mortality of the place.

28. Let there be five columns, in the first of which insert the ages 0, 1, 2, 3, 4.....96, 97, 98, 99, and against every age, insert in the fifth column, the given number that died in the year between that and the next greater age; then begin at the greatest age, and proceed towards the least, as follows:—

1*st*, To the number against any age in the fourth column, add that against the next less age in the fifth, and insert the sum against that next less age in the fourth (7).

2*d*, To the sum of the numbers in the third and fourth columns against any age, add half the number in the fifth column against the next less age, and insert this last sum against that next less age in the third column (11).

3*d*, Divide the number against any age in the third column, by the number against the same age in the fourth, the quotient will be the expectation of life at that age, to be inserted in the second column (16).

1	2	3	4	5
Age.	Expectation of life at that age.	Number of the living at that age, and upwards.	Number who annually complete that year of their age.	Number who die annually in their next year.
0	39·385	393,848	10,000	1888
1	...	...	...	...
2	...	...	...	...
3	...	...	...	...
⋮	⋮	⋮	⋮	⋮
90	2·357	115·5	49	15
91	2·176	74·0	34	11
92	1·978	45·5	23	9
93	1·928	27·0	14	5
94	1·722	15·5	9	4
95	1·700	8·5	5	2
96	1·500	4·5	3	1
97	1·000	2·0	2	1
98	0·500	0·5	1	1
99	0	0	0	0

A complete table of this kind for the two sexes separately, formed from observations made in all Sweden and Finland, during twenty years ending with 1795, will be found in Mr. Milne's *Treatise on Annuities and Assurances*, being the fourth in that work.

29. Hitherto we have supposed the state of the population to continue invariable for 100 years at the least, on account of the facility with which tables of mortality might be

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formed from accurate mortuary registers in such circumstances.

But whether the population be stationary, or increasing, or decreasing, and from whatever causes these changes proceed, provided that they be produced gradually, and not by sudden starts during the time of the observations, the law of mortality may be determined from actual enumerations of the people, and the bills of mortality. Thus,

30. Let the number of persons in each year of their age, that are resident in a place at any one time, be taken, and let an accurate register be kept of the number that die annually in each year of their age, during a term of eight or ten years at the least, whereof the first half may precede, and the second follow the time of the enumeration.

Then, if the number of the inhabitants of every age either increase or decrease uniformly during that term, the mean number of annual deaths in each year of age thus registered, will be the same as if the population of the place had continued throughout that term what it was when the enumeration was made.

31. But if, to the number of the living in any year of age, we add half the number who annually die in the same year, the sum will be the number who annually enter upon that year of their age (11.)

And thus, from the enumerations and registers above mentioned, may be derived the ratio of the number who annually enter upon any year of their age, to the number who annually die in it.

32. But all the observations which have been made with sufficient minuteness, on the mortality during the first year from birth, concur in showing, that many more deaths take place in the first few weeks from birth, than in equal periods of time during the remainder of the first year; and that the nearer to birth, the greater is the mortality among infants. So that the number of the living in successive equal intervals in the first year of age, cannot be correctly assumed to be in arithmetical progression.

33. On this account it is desirable that the annual numbers, both of the children born alive, and the deaths under one year of age, should be correctly registered, as in Sweden.

34. Then, as the number annually born alive, is to the number of annual deaths under one year of age, according to the registers, so is the radix of the table of mortality, to the number dying under one year of age according to that table, which, being subtracted from the radix, the remainder is the number who complete their first and enter on their second year. Whence the numbers, both of survivors and annual deaths, at all the greater ages, may be determined in the order of their succession by No. 31.

35. If, instead of the number of the living in each year of age being taken only once, according to No. 30, that operation be performed several times during the term for which the mean number of annual deaths in each year of age is given;—then, the mean number of the living in each year of age throughout that term, must be deduced from the given numbers; and, being substituted for the number at the middle of the term according to No. 30, the law of mortality may be determined with more certainty, than when the people are only numbered once.

36. Both in enumerations of the people, and in bills of mortality, the numbers are, however, almost always given only for intervals of age of several years each. For the manner of interpolating the numbers in each particular year of age, the reader is referred to Mr. Milne's *Treatise on Annuities and Assurances*, arts. 180 and 181.

37. Hitherto we have only considered the determination of the law of mortality amongst the whole of the inhabitants of a place, of all ages, ranks, and conditions; and until within the last eight years, no statements of facts relating to particular classes of the people had been published, except those of M. Deparcieux, in his valuable *Essai*, sufficiently numerous and correct to be available for the purpose. But the inquiries made by order, and with the aid of government in this country, into the mortality amongst various classes of nominees, on whose lives annuities depended, published in Mr. Finlaison's report to the Lords of the treasury in 1829, and already noticed in the article ANNUITIES in this work; with the publication in 1834, of the still more interesting, important, and distinctly detailed observations on the mortality that has taken place among the lives insured in the Equitable Assurance Society, form most valuable accessions to our knowledge of the subject; we therefore proceed to show how the law of mortality among those classes of persons may be deduced from these documents. We shall have compassed that object, when we have determined out of a considerable number of persons who entered upon each year of age, how many died in that year, and, consequently, how many survived it; and the Equitable Assurance documents are so disposed, as to afford great facility in effecting this. The following table is extracted from them, with the addition of the column marked B.

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A	B		Age 30.+			
			C	D	E	F
Age at admission.	Number admitted of that age.		Attained that age during the observations.	Of that age when they terminated.	Went out of the Society alive of that age.	Died of that age during the observations.
+						
7	40	... ...	5	...	...	...
8	53	... ...	8	...	...	...
9	26	... ...	1	...	...	...
10	31	... ...	6	...	2	...
11	40	... ...	11	1	...	...
12	35	... ...	14	...	...	...
13	53	... ...	13	1	...	...
14	48	... ...	14	2	...	...
15	50	... ...	6	1	1	...
16	66	... ...	20	...	3	...
17	71	... ...	11	...	1	...
18	149	... ...	18	...	...	...
19	250	... ...	26	...	6	...
20	263	... ...	45	2	2	1
21	373	... ...	124	...	5	...
22	438	... ...	177	3	13	1
23	499	... ...	232	4	11	2
24	521	... ...	314	6	19	3
25	643	... ...	421	10	29	2
26	615	... ...	451	7	26	7
27	683	... ...	557	6	31	5
28	732	... ...	676	7	70	4
29	783	... ...	780	1	45	5
30	762	... ...	762	...	1	2
			4692	51	265	32
					51	
			539		762	
			4153		1078	

38. According to the common mode of expressing the ages, which is adopted both in the government documents

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and in those of the Assurance Society, the year of age stated is always that which was last completed; but wherever that is the case, it should be distinctly stated, and kept steadily in view. We confine ourselves in this table to the 31st year of age, and mark it 30+ to avoid ambiguity; for the same reason (+) is put over the ages in column A, to show that each number in it denotes the age last completed.

39. Column B has been added for the sake of illustration; it shows at what earlier ages the different lives entered the society, which afterwards completed the 30th year of their age in it, and entered their 31st: thus, out of 40 insured in the 8th year of age during the period of the observations, only 5 entered their 31st while insured in the society, the rest having passed out of it either by death or otherwise, at earlier ages, as the preceding columns of the original table fully show; and of the 373 persons who were insured in their 22d year, 124 remained insured till they entered their 31.

40. This table shows that of 4692 persons who entered on their 31st year of age in the society, 265 went out of it alive in the same year of their age during the observations, 51 were still living and insured at the termination of the observations, and 762 came into the society in that year of their age; the individuals of those three classes amount together to 1078 persons. But of the 265 who went out of the society alive during that year of age, it may reasonably be assumed, that whatever number of them at the time of their exit exceeded $30\frac{1}{2}$ years of age by any interval of time, as many would fall short of that middle age by the same interval, when they went out; and, therefore, that the whole of them on an average may properly be considered to have been exposed to the action of the Law of Mortality during one half of that year of age; so that the mortality among them must have been the same as it would have been among half the number of exactly similar lives, in passing through the whole of that year.

In the same manner it appears, that of the 762 persons who were insured at various periods of the 31st year of age, and of the 51 persons who remained alive and insured in the society at various periods of that year of age when the observations terminated; may, each of them on an average, be properly assumed to have been exposed to the action of the law of mortality in the society during one half of the 31st year of age; and we are therefore entitled to conclude that the mortality among them was the same as it would have been among half the number of exactly similar lives in passing through the whole of the 31st year of age.

But 4692, the total of the numbers in column C includes all those 1078 lives, the same as if they had all entered upon their 31st year of age in the society, and had all passed through it except those which were carried off by death. It is, therefore, manifest, that 539, the half of their number, must be substracted from 4692, and the remainder, 4153 must be taken as the number of persons entering on the 31st year of their age, and continuing exposed to the law of mortality in the society during the whole of that year, among whom thirty-two deaths take place in the same year of age.

This, when the principle is clearly understood, is certainly a very simple operation and easily performed; and its application to every other age in the original table of data is exactly the same as to the 31st year.

41. In constructing the table of mortality, supposing that in proceeding from the earliest age we have arrived at the completion of the 30th year, or the entrance on the 31st, and have determined the number of survivors at that limit to be 4305; since

$$4153 : 32 :: 4305 : 33{\cdot}1712,$$

we find 33 to be the number of deaths which will take place in the 31st year of age out of 4305 persons who enter on it; and, consequently, that 4272 enter on their 32d year, according to the table we are constructing; the method of completing it is obviously the same throughout, and can be attended with no difficulty after the valuable documents requisite for the purpose have been obtained.

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42. What has been shown here respecting the determination of the law of mortality amongst insured lives, applies also, and with rather more facility to the nominees on whose lives annuities depend. The life annuities sold by government in this country not being redeemable, are always continued during the whole of the lives they depend upon; therefore, with regard to them, column E in the above table is left blank; and in the case of the old English Tontine, which commenced in 1693 and ended in 1783 with the life of the last survivor, column D will also be quite blank.

PART III.—*On the Law of Mortality as deduced by the preceding methods from actual observations; and on the comparative merits of the different Tables of Mortality that have been published.*

43. When the uniformity of anatomical structure in different individuals of the human species is considered, and the great power possessed by the human body, of so adapting itself to the circumstances it is placed in, as to avoid injury from changes in those circumstances, it appears natural to expect *a priori*, that, where the circumstances of the people are not greatly different, the law of mortality will be nearly the same. And, from a comparison of the best tables of mortality yet constructed, we are induced to believe that this expectation will be realized, whenever a sufficient number of good observations shall have been made, under circumstances sufficiently varied.

44. We know of no observations that have hitherto been made and published, from which the law of mortality may be correctly determined, except the following:

1. Those of M. Deparcieux in France.
2. The Swedish.
3. Dr. Heysham's at Carlisle.
4. Dr. Cleland's at Glasgow.
5. Mr. Finlaison's on the nominees of life annuities granted by government in this country.
6. Mr. Morgan's on the lives insured in the Equitable Assurance Society.

Those of Deparcieux, Finlaison and Morgan, were made only on select classes of the people; the Swedish are incomparably the most numerous and extensive; and whilst Dr. Cleland's exhibit the mortality in a large manufacturing town, Dr. Heysham's will, we believe, be found to be best authenticated, and most correct.

45. The climate of Sweden is so unfavourable to the products of agriculture, and the number of the people is so great in proportion to the quantity of food produced, that unfavourable seasons there, are generally followed by distressing dearths, and the destructive epidemical diseases constantly attendant upon famine, which raise the mortality, when they occur, much above what it would otherwise be; and both in that way, and by weakening the constitutions of those who survive them, they materially increase the average mortality deduced from observations made during any considerable number of years. Of this the reader will find ample proofs drawn from authentic sources, in the 10th, 12th, and 13th chapters of Mr. Milne's *Treatise on Annuities*.

46. For these reasons, the mortality in Sweden deduced from many years' observations, will be found to be higher than in the more temperate aud fruitful parts of Europe. And we shall probably make the nearest approach to the general law of human mortality in the temperate climates, that can be made from the Swedish observations, by selecting a period in which no remarkable epidemics prevailed. Such a period was that of five years, 1801–1805; during

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which, according to a statement of M. Nicander, in the *Transactions of the Royal Academy of Sciences at Stockholm* for the year 1809, the population and mortality were as stated in Table I. at the end of this article.

47. From these *data*, the second table at the end of this article has been formed. The numbers in the columns for males and females separately, having been determined according to Nos. 36 and 31–35; assuming that, of 20,000 children born alive, 10,219 are males, and 9,781 females, in the ratio of 275,599 to 263,812.

The numbers against each age in the columns for the whole population without distinction of sex, are arithmetical mean proportionals between the corresponding numbers in the columns for males and females separately, against the same age.

48. From the table last mentioned, Table III. has been deduced by No. 16, exhibiting the expectation of life *at* every fifth year of age; or its mean duration *after* that age.

49. Vaccination commenced throughout Sweden and Finland in 1804, during which year, the number vaccinated was 38,255; and, in the year following, 42,839.

The number of deaths by small-pox there, during the year

1801, was	6,458
1802, —	2,679
1803, —	8,610
1804, —	3,764
1805, —	1,887
Sum,	23,398
Annual average number,	4,680

Whilst the annual average of the ten years ending with 1803, was 6962. (*Vet. Ac. Handl.* 1809, and Mr. Milne's *Treatise on Annuities*, art. 698.)

50. Therefore if we assume that, had vaccination not been practised in the years 1804 and 1805, the annual average number of deaths during the five years ending with that last mentioned, would have been greater by 2,282 than it actually was, and that these 2,282 additional deaths would have all taken place under five years of age, both assumptions will be near the truth; and it will follow that the annual mortality under five years of age, which actually was but one of 13·534, would have been one of 12·629, had vaccination not been introduced. Its introduction cannot have affected the first three tables above five years of age; and under that age, not quite so much as has just been stated.

51. Of all ages, and both sexes, there actually died annually, during these five years, one of 40·901; had vaccination not been practised at all, the annual average mortality would not have been so great as one of 39·759.

52. Table IV. exhibits the mean duration of life after every fifth year of age, according to twelve different tables of mortality; the first six, A, B, C, D, E, F, having been constructed from the requisite *data* (30 and 38,) the last six, M, N, O, P, Q, R, from mortuary registers only.

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53. The numbers in the first column A have been taken from table III. in Mr. Milne's *Treatise on Annuities*, and those in B from table E (p. 28) in the Equitable Assurance Society's publication.[1]

54. Deparcieux's table C constructed from great numbers of accurate observations on the nominees in the French Tontines, resident principally in Paris and its environs, represents the duration of life too small after 60 or 65 years of age. (See Mr. Milne's *Treatise on Annuities*, articles 867 and 868.)

55. Column D has been taken from the 45th table in Dr. Price's *Observations*, E from the 5th in Mr. Milne's *Annuities*, and F from the 3d table in this article. All these tables represent the duration of life in Sweden and Finland, after 45 or 50 years of age, to be less than according to the others; and it might reasonably be expected, *a priori*, that the excessive cold in Sweden would be unfavourable to the prolongation of life in old age.

56. Of the less correct columns, M has been deduced from the 7th table in Mr. Milne's *Annuities*, and N from the 42d in Dr. Price's *Observations;* but, as the Montpellier and Chester tables, just referred to, give the expectations of life only for males and females separately, the numbers in columns M and N against each age, are arithmetical mean proportionals between the expectations for males and females against the same ages in those tables; which, though not quite correct, is fully sufficient for our present purpose.

57. The number in column O against each age has been derived from that given by M. Mallet in his table of mortality as the mean duration of life in Geneva from and after that age, by subtracting one half (0·5) from each of them; which will be found to be a necessary correction.

58. Column P has been derived from Lambert's table for mankind in general, already mentioned in the historical part of this article, in which he gives a column headed *mean age*. Thus, against the age of 20 in that column, stands 54·3, by which he means that persons who survive 20 years of age, do, on an average, attain the age of 54·3 years; so that their expectation of life at 20, will be 34·3. But his numbers in that column are all too great by $\frac{1}{2}$, or 0·5, as he has himself demonstrated; the last, therefore, should be 33·8; and

Against the age of	For his number.	We insert in column P.
0	29·5	29·00
5	47·7	42·20
10	51·4	40·90
15	53·1	37·60
and so on.		

[1] The author of this article in reading the note on the 4th and 5th pages of Mr. Arthur Morgan's introduction to the valuable work above mentioned, when that gentleman was so good as to send it to him on its first publication, had noted with a pencil in the margin, that the practice there stated was not quite correct; but the circumstance had long passed from his recollection, when he showed in No. 40 of the present article, how the law of Mortality in the Society might be determined from the large and valuable table marked A; therefore, by the words "age on admission," at the head of the extreme left hand column over the age in the same horizontal line with the number of lives admitted in the first division of the large column with that age at its head, he was naturally led to conclude that that was, as it ought to be, the number of lives which really were insured during the observations, when that was the age they had last completed. But by the note referred to, it appears not to be so; on the contrary, none of the lives insured during any year commencing with the first of January, are entered in these statements as having come into the Society until the first day of January next following the day of their actual admission, and then each is stated to be one year older than it was when insured; although whatever deaths may happen amongst them before the first of January next following the commencement of the insurances, are entered in the statements as having taken place amongst the lives previously insured. The manuscript being wanted immediately, was in the hands of the printer, 400 miles from the author, before these circumstances were called to his recollection, by his accidently seeing his original note on the subject; he is therefore anxious to give this explanation. The principle of the method of determining the law of mortality in such cases, remains just the same. But it now appears that the number stated in Table A to have been admitted at any age, should have been stated to be so at the next younger age; and any calculator who may choose to employ himself on the subject, had better make that correction before proceeding farther. The probable error arising from the fault will not be great; but it is incumbent upon us to state the right method of proceeding.

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59. The reason assigned by Lambert for voluntarily admitting this error at each age, as well as the corresponding one in the number of the living at and above the same age, into his table, was, that he did not consider the data in his possession enabled him to determine the duration of life within half a year of the truth.

60. In both these errors M. Lambert has been followed by J. C. Baumann, in constructing the 21st, 22d, and 23d tables inserted at the end of the third volume of Süssmilch's *Göttliche Ordnung* which were intended to represent respectively, the law of mortality among the country people in the churmark of Brandenburg, amongst the whole population of the churmark, and amongst the inhabitants of London.

61. The numbers in column Q were calculated by Deparcieux from Dr. Halley's table; and those in column R have been extracted from the 18th table in Dr. Price's *Observations*.

62. Upon comparing the numbers in the first six of these columns, which are more correct, with those in the last six, which are less so; it will be found, that at the early periods of life, its future mean duration according to the tables formed from mortuary registers alone, is less than according to those formed from the requisite data; also that the difference is greater the younger the lives are, and diminishes while the age increases, so as at 60 or 65 years of age to be little or nothing, and to continue small, and variable both in kind and magnitude, through the rest of life.

63. This appears to have arisen from the number of the people having varied but little during the first 35 or 40 years of the century that ended at or about the middle of the term in which the observations were made; and having increased considerably by procreation, during the remainder of that century; such increase having been slow at first, but gradually accelerated afterwards.

64. Table V. is calculated to illustrate this part of the subject. The columns A and B represent the law of mortality among the whole population of Sweden and Finland without distinction of sex, having been merely copied from Table II.

Column C shews the proportion of 10,000 annual deaths in Sweden and Finland that took place in each year of age, on an average of five years ending with 1805. And the number in column D against any age, being the sum of of those in column C against that and all the greater ages, would be the number who annually attain to that age, if the number of the people of every age had remained stationary from the year 1700 till 1806 (7).

65. The table of mortality formed by the columns C and D therefore, is that which Dupré de Saint Maur, Süssmilch, Lambert, Baumann, Florencourt, Muret and others, for want of the mortuary registers of a whole country, endeavoured to form by combining the registers of different town and country parishes.

Those tables also have the same faults, which have been formed in a similar way for particular towns or other comparatively small districts, from the bills of mortality alone, where the population had been increasing during the century preceding the commencement of the observations or statements in the bills of mortality which each table was formed from, and also during the period of the observations.

66. But it has been ascertained by repeated enumerations of the people in Sweden and Finland, that the hypothesis of their number having remained stationary for the last 100 years or more, is far from the truth. And by comparing columns A and B with C and D, it will be seen in what manner, and to what degree, the falsity of the hypothesis in this case, has vitiated the table derived from it.

67. To facilitate this comparison, columns E and F have been added. Taking the age of five years for an example; the numbers against that age in columns C and D show, that, according to the hypothesis, out of 5988 children who annually enter upon their 6th year, 144 die in it; while it appears by columns A and B, that out of 7096 children who enter upon that year of their age, only 112 die in it: and 112 : 7096 :: 144 : 9123, so that 9123, inserted against the age of five years in column E, is the number of children annually entering upon their 6th year, out of whom 144 *really* die in the same year of their age; and the mortality as represented by the hypothetical table in this case, is to the true mortality, as 9123 to 5988, or as 3 to 2 nearly.

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Then the number in column F against any age, is always the excess of that in E above that in column D against the same age.

68. Columns B and C both containing 10,000 deaths, it will be seen that in column C, they are greatly accumulated at the early ages, in comparison with those in column B; and that in old age, the deaths in column C are much less numerous than in B; which are necessary consequences of the people increasing by procreation; the numbers of the people in a progressive population, in comparison with a stationary one, being greater in early life, and less in old age. And, while the law of mortality remains the same, the numbers of deaths at the different ages, must necessarily be distributed in a similar manner.

69. This enables us to see clearly how the principal differences have arisen between the correct and incorrect tables of mortality AB and CD; whilst the number of annual deaths at all ages (10,000) is the same in both, the proportions of that number are necessarily in column C of the increasing population greater, and the deaths are more densely distributed at the early ages, and less so at the advanced ones than in column B of the population which has consisted of the same number of persons of every age, and has produced the same number of annual births and of annual deaths at every age for 100 years past. The increasing population is necessarily attended with a corresponding increase of the annual births and of young persons; while the elderly persons are only those left by the law of mortality out of the corresponding small numbers that were born annually, 50, 60, 70, or 100 years back. And as columns A and B represent the true law of mortality that prevails among the people, columns C and D cannot do so, although constructed from observations on the same people; for in an increasing population it is not true that the sum of the deaths happening annually above a given age will be the same as the number of persons annually arriving at or completing that age; it always falls short of it, and the more so as the given age is younger, there being deficiencies at all ages above that.

Columns E and F show what the errors of the hypothetical table are at the different ages, and they are of a similar kind in all tables similarly constructed from records of the number of deaths at the different periods of life in an increasing population; and such are probably 99 out of 100 of those hitherto published; many of them for people increasing their numbers much faster than the Swedes have done, and the errors of such tables must be greater than those of the table CD.

70. Table VI., which needs no further explanation than is placed at the head of it, will also illustrate the difference between tables of mortality formed from the requisite data, and those constructed from mortuary registers only.

It is better fitted for this purpose than Table IV., with which, however, it will be found to correspond very well. But the 4th table has other uses which this has not.

71. From what has already been advanced, it would appear probable, that the number of annual births in Sweden and Finland had been nearly stationary, and rather decreasing than increasing, upon an average, from about 1700 till 1735.

The numbers both of the annual births and deaths, from the year 1749 till 1803, will be found in Milne's *Treatise*

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on Annuities, art. 698: these kind of returns to government were not made before 1749, neither have we any satisfactory account of the population before that period.

72. But the statements in our 7th table corroborate the inferences just drawn from the 5th and 6th, as they shew that during the 43 years ended with 1800, the total population increased, while the proportion above 90 years of age diminished through the whole term, and increased very little during the next 10 years.

The numbers in that table include both sexes, and the long continued diminution of them past 90, cannot be explained by supposing the males to have fallen in battle; for the females were reduced in the same proportion, their number throughout, having been to that of the males above 90 years of age, as nine to five nearly.

From the 7th table, therefore, it appears probable, that the annual births in the years

1698, 1705, 1710, and 1715,

were respectively proportional to the numbers..... 907, 637, 837, and 786.

The last number, 786, has been calculated upon the supposition that the proportion of the population in Sweden and Finland to those in Sweden alone, was the same in 1810 as in 1805.

73. It should also be observed here, that the disastrous career of Charles the Twelfth commenced with the eighteenth century, and terminated in 1718, when the country was in such a state of exhaustion as it could not have recovered from for many years; whence there appears reason to believe, that the annual births during the succeeding fifteen or twenty years, did not increase fast.

Cantzlaer informs us, that between the 10th of August 1710, and the month of February 1711, near 30,000 persons were carried off by the plague in Stockholm alone. (*Mém. du Royaume de Suède*, t. i. p. 29.)

74. It will be seen that the numbers in col. F of Table V., in proceeding back from four years of age to birth, continually decrease, contrary to what generally obtains; and as we ascribe the general increase of these numbers, when taken in the retrograde order of the ages, to the annually increasing number of births, so will this anomalous appearance be found to arise partly from the average number of annual births having actually *decreased* for a few years; for

During the five years ending with	The annual average number of births was
1800	107,690
1801	106,392
1802	105,504
1803	104,644
1804	105,430
1805	107,882

But it appears to have arisen principally from the practice of vaccination during the years 1804 and 1805, by which the mortality among children, or the numbers in col. C, in a few of the first years from birth, were reduced below what they otherwise would have been (50) while those in col. D remained nearly the same (64); consequently, the numbers in col. E were reduced in nearly the same ratio as those in C (67), and the reduction in col. F. was in each case nearly the same as in E (61).

75. The numbers relating to Sweden and Finland in the 7th table, have been derived from the Stockholm *Transactions* for the years 1766, 1801, 1809, and 1813.

Those relating to Spain and the Spanish possessions in Europe and Africa, including the Canary Islands, from the *Censo de la Poblacion de Espana en el ano de* 1797, mentioned in the first section of this article. These last have been included in this Table, to show the difference in the proportion of aged persons between Spain and Sweden, and still more between the Canary Islands and both.

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76. If the population of Spain had remained invariable from 1697 to 1797, the law of mortality there, might have been easily derived from the statements above mentioned of the enumeration in 1797; but in the actual state of things, that cannot be determined without comparing these with exact accounts of the numbers that died annually in each interval of age. And, as was observed in the first section of this article, the author has obtained satisfactory information that no such returns from the parish registers throughout Spain, as are there mentioned, ever were published, nor is it probable they were ever made.

77. When what we have advanced respecting the 5th and 6th tables is clearly understood, it will not be difficult to account for the greater part of the difference between the more and less correct columns in Table IV.

Most of the observations which the German tables were constructed from, were made between the years 1720 and 1750; and those who died then between 60 and 100 years of age, must have been born between 1620 and 1690; in which period nearly the whole of the thirty years' war, ended in 1648, was included, during which, and for several years after, it is probable that the annual births increased little or nothing, if they did not decrease.

78. Amongst the less correct columns of Table IV., those for Montpellier, Chester, and Geneva, agree much better than the rest with the more correct ones, which has probably arisen in each case, partly from the mortality in these three places having really been less throughout life than in most large towns; and partly from the annual births in them, having increased less than in the other places, during the fifty or sixty years preceding the period in which the observations the tables were constructed from were made.

79. The Northampton table was constructed by Dr. Price, from the bills of mortality (from the year 1735 to 1780) of the single parish of All Saints, containing a little more than half the inhabitants of the town; and as the deaths exceeded the births in number, the Doctor applied a correction to the table under twenty years of age, which, if it had answered the intended purpose under that age, as we are satisfied it did not, could have no effect on any of the numbers above the same age; and almost all of the useful applications of such tables, are to ages above twenty.

80. The table so formed could only be correct, provided that the numbers, both of the living and the annual deaths at every age above twenty years, had continued invariable during the 146 years that intervened between 1634 and 1780; provided also, that no migration from or to the town took place, except at twenty years of age, and that the annual increase the population received by migration at that age, was just equal to the excess of the annual deaths above the annual births.

81. But we consider it to be much more probable, that during these 146 years, Northampton partook of the prosperity and adversity that prevailed in the rest of the kingdom; and, consequently, that its population was generally progressive, though sometimes stationary, and sometimes retrograde.

82. We have not room here to support this opinion by numerical statements and calculations, but from the population abstracts, and an enumeration of the inhabitants of Northampton, given in Dr. Price's *Observations on Reversionary Payments*, (vol. ii. p. 94,) it will be found, that both the annual births, and annual settlers in that town, have been increasing ever since about the year 1715 or 1720; also, that although the burials exceeded the baptisms till the year 1802, the supply by migration was much greater than that excess; and, consequently, that the numbers of the living have been accumulated more at the early ages, and less at the advanced ones, than they would have been had the population remained stationary.

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83. Thus it appears, that the faults in the Northampton table are of the same kind as those of the others constructed from mortuary registers only. And the civil war in the time of Charles the First, with the unsettled state of the kingdom for some years before and after it, would probably have prevented or greatly retarded, the increase of the annual births, during the time in which those persons were born, who died past sixty years of age between the years 1734 and 1781, and may account for the table after that age being near the truth; while the comparatively rapid increase of the people during the sixty years ending with 1780, appears to explain the great excess of mortality in that table at the early periods of life.

84. As it was only from the Carlisle and Northampton tables of mortality, that tables of the values of annuities on single and joint lives had been calculated, sufficiently copious to admit of the values of interests dependent upon the continuance or the failure of human life being accurately derived from them. When the first edition of this article was published in the year 1820, the author gave the following comparison between the mortality represented by each of these tables to take place at the different periods of life, with that which had been observed to obtain among the members of the Equitable Assurance Society.

85. From an address delivered at a general court of that Society, by Mr. Morgan the actuary, on the 24th of April 1800, it appears, that according to the result of an annual experience of thirty years, the decrements of life (22) among the members of the society, were to those in the Northampton table,

Between the ages of	10 and 20	as 1 to 2.
	20 — 30	— 1 — 2.
	30 — 40	— 3 — 5.
	40 — 50	— 3 — 5.
	50 — 60	— 5 — 7.
	60 — 80	— 4 — 5.

The same information may also be found in two notes in Dr. Price's *Observations on Reversionary Payments*, (vol. i. p. 183, and vol. ii. p. 443.)

86. From the preceding statement, the Carlisle table of mortality, (No. II. in Mr. Milne's *Annuities*, or No. V. at the end of the article ANNUITIES in this work, and the Northampton table, (No. XVII. in Dr. Price's *Observations*), we have derived the following:—

Out of	Who attain the age of	There die before the age of	According to the		
			Carlisle Table.	Experience of the Equitable Society.	Northampton Table.
Persons.	Years.				
6460	10	20	370	309	618
6090	20	30	448	443	886
5642	30	40	567	579	965
5075	40	50	678	652	1086
4397	50	60	754	900	1260
3643	60	80	2690	2244	2805

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87. This table shows that the law of mortality exhibited in the Carlisle table is almost exactly the same as that which has prevailed among the members of the Equitable Assurance Society. And although the members of such a society, when they first enter, are select lives, they are not, even then, so much better than the common average, as many persons suppose; for the more precarious a life is, the stronger is the inducement for parties interested in its continuance, to get it insured, so that bad risks are frequently offered to such companies. And many proposals for insurance are accepted by the directors, that are not thought very eligible at the time, in cases where they are not aware of any specific objection to the life proposed.

88. Besides, it is to be considered, that of the number in a society at any one time, but a small proportion can have been recently admitted, and in a few years from the time of admission, the members will generally have come down to the common average of persons of the same ages.

89. It ought also to be observed, that most of the tables of mortality that have been published, have been constructed from observations made upon the whole population of very large towns, such as London, Paris, Vienna, and Stockholm; in each of which there are particular quarters inhabited only by the very lowest of the people, who, unfortunately, are also very numerous, badly clothed and fed, therefore exposed to serious injury from the inclemencies of the weather; extremely ignorant and vicious, indulging in the abuse of spirituous liquors, and inattentive to cleanliness both in their persons and habitations, which last are crowded, badly ventilated, and surrounded with mud and the putrid remains of animals and vegetables. These are the nests of contagious diseases, in which they are generated and kept alive, where they at all times occasion great mortality, though not so much within the last forty-five or fifty-five years as previously, and from which, when circumstances favour them, they spread amongst the rest of the people.

90. It is, therefore, obvious, that in such places, the average mortality at every age, must be considerably greater than that which prevails only among the middling and higher classes of society, even in such towns.

91. But the lives upon which leases, annuities, reversions, and assurances depend, are very seldom exposed to the influence of the causes of mortality mentioned in number 89. Whence it follows, that a table of mortality on which those causes have had no great influence, is best adapted to the valuation of such interests.

And these kind of valuations are the most important purposes to which tables of mortality can be applied.

92. The number of years in *the mean duration of life from birth* according to a table of mortality properly constructed from the necessary data, will, when the population has remained stationary for a century or more, be the same as the number of persons in the whole population, out of which one dies annually (20). When the population has been increasing, the mean duration of life, according to the table, will be less than the number out of which one dies annually in that population; but the difference will be small, except under particular circumstances, as appears by the following statement.

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	Place.	Years.	Term of the observations.	Died annually, one of	Mean life.	Difference.	Authorities.
1	Stockholm, males.....	9	1755–1763	16·86	14·25	2·61	Dr. Price's *Observations*, tab. 46.
2	Ditto, females.....	9	1755–1763	20·93	18·10	2·83	Ditto.
3	Ditto, both sexes.....	9	1755–1763	18·85	16·18	2·67	Ditto.
4	Sweden and Finland.....	21	1755–1776[1]	34·60	34·45	0·15	Ditto, tab. 44.
5	Ditto.....	20	1776–1795	37·33	36·12	1·21	Mr. Milne's *Annuities*, tab. 5.
6	Sweden alone.....	5	1801–1805	40·90	39·39	1·51	This article.
7	Carlisle.....	9	1779–1787	40·00	38·72	1·28	Mr. Milne's *Annuities*, tab. 2.
8	Glasgow, males.....	10	1821–1830	35·42	34·38	1·03	Dr. Cleland's *Observations*, and a table of mortality formed from them by the author of this article.
9	Ditto, females.....	10	1821–1830	42·32	37·24	5·08	
10	Ditto, both sexes.....	10	1821–1830	38·81	35·77	3·04	

93. The above mentioned table of mortality for Glasgow, which the author has had by him several years, he expects to publish soon.

The high number in the column of differences for females in that place, arises from the small mortality amongst them, which was occasioned principally by the great influx of healthy females between the ages of 15 and 30, at which period of life the rate of mortality amongst them was small; its *minimum* for them being in their 18th year.

Between the ages of 10 and 15 the numbers of the two sexes were just about equal, whilst between the ages of 15 and 30 the females were more numerous than the males in the ratio of 3 to 2; and this accounts for the great number of females (42·32), out of which one died annually there, which necessarily raises the number out of which one died annually in the whole population of both sexes, and therefore the number in the column of differences (in the line numbered 10) for the whole population of both sexes in Glasgow.

94. Similar causes probably produced similar effects, although in a much less degree in Stockholm.

95. When tables of mortality are constructed from the numbers of deaths only in the different intervals of age, without comparing them with the numbers of living persons in the same intervals; such as that formed by columns C and D of Table V. at the end of this article, and the population is increasing. The number of years in the mean duration of life from birth, according to that table, will fall short of the number of the people, out of which one dies annually, by a much greater number than in the case we have just been considering, of the table of mortality having been properly constructed from the necessary data: as the following statement will show.

	Place.	Years.	Term of the Observations.	Died annually, one of	Mean Life.	Difference.	Authorities.
1	Sweden and Finland.....	5	1801–1805	40·90	30·86	10·04	Table V. C. & D. and Tab. VI. D.
2	Belgium.....	3	1825–1827	43·00	32·15	10·85	MM. Quetelet and Smits, *Recherches*, &c., 8vo, 1832, pp. 29 and 36.
3	Berlin.....	12	1818–1829	36·91	27·39	9·52	Dr. Casper; *Lebensdauer der Menschen*, tab. 2 & § 14, s. 35; also *Staatskräfte der Preussischen Monarchie*, b. 1. ss. 303 & 304.
4	Geneva, males.....	20	1814–1833	45·00	37·97	7·03	M. Mallet, in the places referred to above.
5	Ditto, females.....	20	1814–1833	48·69	42·21	6·48	
6	Ditto, both sexes.....	20	1814–1833	46·92	40·18	6·74	
7	Chester, males.....	10	1772–1781	34·54	28·13	6·41	Dr. Price's *Observations on Rev. Payments.*
8	Ditto, females.....	10	1772–1781	37·27	33·27	4·00	
9	Ditto, both sexes.....	10	1772–1781	35·97	30·70	5·27	
10	Montpellier.....	21	1772–1792	29·56	25·36	4·20	Mr. Milne's *Annuities.*

96. In both of the above statements, where the sexes are not mentioned, the table is for both without distinction.

97. In places where the increase of the population was slow, the numbers set against them in the column of differences are smaller than where the population increased more rapidly.

98. In the tables of mortality for Belgium and Montpellier, the sexes were distinguished, but not in the given number of the whole population, as well as the whole number of deaths in each of those places, and for that reason the sexes could not be distinguished for those two places in this last table.

99. When what we have shewn here is clearly understood, and the proportion of the people dying annually is known, it will not be difficult to judge whether a table of mortality for that people has been constructed properly from the necessary data; or, what is much more common, and more easily effected, merely by summation of the deaths at all ages. For in the case of the correct table of mortality, the difference obtained in the manner stated above, will probably not exceed 2; nor in the case of the incorrect table, will it be likely to be less than 7, upon the supposition of the population having increased generally for a considerable number of years preceding the termination of the observations; if for a whole century, so much the better.

[1] But omitting the year 1764, in which no observations were made.

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100. The probable life at birth, or the age to which half the number born attain, will also be a good criterion for enabling us to judge, by comparison, whether a table of mortality has been correctly constructed from the necessary data or not; provided that, in the places the compared tables have been constructed from, the children have been similarly circumstanced, or nearly so.

According to the	The probable duration of life from birth, is	The probable duration of life from 10 years of age, is
Correct table for Sweden, in this article,	45 years.	53 years.
Incorrect one,	22 —	48 —
Belgian table,	25 —	48 —

In Belgium vaccination was practised during the whole period of the observations, in Sweden only during about $1\frac{1}{2}$ out of the 5 years' observations.

101. From all that has now been stated, we are entitled to conclude, that the Belgian table of mortality has been constructed either from the registers of burials alone, or only from the statements of the numbers living in the different intervals of age at the time of the enumeration; most probably from the burials alone. M. Quetelet appears now to be aware that such tables are very incorrect. In his late work *sur l'Homme et le Dévelopement de ses Facultés, ou Essai de Physique Sociale*, 2 tom. Paris 1835, in 8vo, after giving the above mentioned table of mortality for Belgium, in which only the numbers attaining the different ages are given, without the decrements of life, or its mean or probable duration at the different ages, he states the mean duration of life from birth according to that table, and then proceeds thus, (tome i. p. 166):—"D'après le dernier ouvrage de M. Rickman, la vie moyenne serait en Angleterre de 33 ans (32 pour les hommes, 34 pour les femmes).[1] On l'estime en France de 32·2 ans d'après le chiffre des naissances.[2] Du reste, ces calculs supposent une population stationnaire, et nous aurons occasion de voir qu'ils peuvent conduire à des erreurs assez graves."

102. Reasoning as in Nos. 68 and 69, it will be seen that when the number of the people has been decreasing for a series of years, the deaths will be more densely distributed among the advanced ages, and more rarely in the early periods of life, than if the number of the people at every age, and the law of mortality had remained always the same. Consequently, in the table of mortality constructed from such data, merely by taking the successive sums, in retrograde order, from extreme old age to birth; those successive sums, which are the numbers of the living at the different ages in the table so constructed, will be greater at advanced ages and less in early life than if the population had remained stationary, as stated above. So that the errors of the incorrect table would, in this case, be of the opposite kind to those of the common tables, constructed in a similar way from the deaths only, in an increasing population. From the general increase of arts, manufactures, commerce, and civilization, ever since tables of mortality were first formed, the population has been increasing more or less rapidly in almost every place, for which a table of mortality has been constructed. But in Amsterdam we have an instance of the population having continued to decrease for half a century or more. We here present a view of it since the year 1622.

Population of Amsterdam.

In the year	Number of persons.	Authorities.
1622	104,961	Struyck, *Nader Ontdekkingen*, p. 118.
1753	200,000	Ditto ditto, p. 146.
1777	241,353	Quetelet *sur l'Homme*, tom. i. p. 246.
1787	224,862	R. Lobatto *on Life Insurance*,[3] p. 20.
1826	200,784	Ditto, p. 21.
1830	202,175	Quetelet *sur l'Homme*, tom. i. p. 246.

103. The information on this subject is scanty and difficult to procure. Kersseboom took much pains in endeavouring to make just estimates of the population from the annual births and deaths; and taking it to be 35 times the number of annual births, he estimated the population of Amsterdam in 1742 at 241,000 persons.

Three only of the six numbers stated above, viz. those for the years 1622, 1826, and 1830, were determined by actual enumerations at the times stated. Although M. Smits, the secretary of the Statistical Commission, relative to the population of the Netherlands, is not mentioned in the above table, we are greatly indebted to him. In his *Statistique Nationale* he gave a table, (No. 10, p. 82), shewing the number of deaths that took place in Amsterdam in each year of the 18th century. M. Lobatto has given them in the place above referred to for each of the ten years 1816–1825; and M. Quetelet, in the part of his work referred to above, has given them for each of the 17 years, 1816–1832, and states that in the year 1777 the mortality was 1 in 27; the number of deaths in that year was 8939, whence the population inserted in the table is derived. M. Lobatto states, on the authority of Professor Van Swinden and of M. Nieuwenhuys, that from 1774 to 1813 there died annually 1 of 26; the deaths in 27 years, 1774–1800, were 233,510, the annual average number, therefore, was 8648·5, and multiplying this by 26, we obtain 224,862, the mean number of the people during these 27 years, which is stated in the above table to have been the population in 1787, the middle year of the 27.

104. The enumeration in 1622 was made in levying a capitation tax, which was exacted with great strictness, even in every receptacle for paupers, the master or owner of it was obliged to pay the tax for each inmate. This enumeration appears not to have been known of, either by Kersseboom or by Struyck at the time of his first publication on the subject; but an original paper, with many particulars which he gives, was afterwards communicated to him. Struyck, after taking great pains with the subject, stated his opinion, that in 1753, Amsterdam did not contain 200,000 inhabitants.

105. M. Lobatto, at the end of his *Beschouwing*, &c. gives two tables of mortality for Amsterdam, one for males, the other for females, constructed from the deaths that took place during the ten years 1816–1825, with the expectation of life at every age, and we here give the same particulars for it as are given for some others above, but marking the difference (—) as it is of the opposite kind to those which resulted from an increasing population.

Place.	Term of the observations.	Died annually, one of	Mean duration of life.	Difference.
Amsterdam.	10 yrs. 1816-1825	29·22	32·22	— 3·00

[1] Preface to the Population Abstract. 1831.

[2] *Annuaire du Bureau des Longitudes, pour l'année* 1834. p. 102.

[3] *Beschouwing van den aard, de voordelen, en de inrigting der Maatschappijen van Levensverzekering*, &c., door R. Lobatto; Amsterdam, in 8vo, 1830.

Mortality, Law of.

106. This low mortality of one in 29·22 was obtained by M. Lobatto stopping at the year 1825, which he himself states was on account of the mortality having been high in the two following years, 1826 and 1827. He obtained the annual mortality of 1 in 29, by dividing the number of the people in 1826, the year after the end of the term, by the annual average number of deaths during the term. During the 12 years 1821–32, of which 1826 was the middle one, the annual average number of deaths was 7,336·18, and there died annually, on an average, one of 27·369; the *difference* in the above statement should therefore be —4·85, or nearly 5; which is the true excess of the number of years in the mean duration of life, above the number of persons out of which one died annually.

Mortality, Law of.

107. For some of the most important applications of the facts and inferences stated in this article, the reader is referred to the article ANNUITIES in this work, where he will find that the valuation of ASSURANCES or REVERSIONS dependent upon lives is also treated of.

TABLE I.

In all Sweden and Finland during the Five Years ending with 1805.

Between the ages of	Mean number of the living.		Annual average number of deaths.		That is, Males one of.	That is, Females one of.
	Males.	Females.	Males.	Females.		
0 and 1	44,536	43,847	11,132	9,238	4·00	4·74
1 — 3	85,548	86,533	4,113	3,752	20·79	23·06
3 — 5	84,854	85,909	1,857	1,771	45·69	48·57
5 — 10	170,878	171,343	1,919	1,743	89·04	98·30
10 — 15	161,613	160,777	872	797	185·33	201·72
15 — 20	140,467	144,782	799	795	175·80	182·11
20 — 25	132,414	143,012	1,018	927	130·07	154·27
25 — 30	120,349	130,183	977	978	123·18	133·11
30 — 35	108,804	118,978	982	1,056	110·79	112·67
35 — 40	100,293	111,158	1,078	1,150	93·03	96·06
40 — 45	94,497	103,711	1,293	1,324	73·08	78·33
45 — 50	82,258	91,932	1,442	1,255	57·04	73·25
50 — 55	71,899	81,265	1,811	1,582	39·70	51·36
55 — 60	54,543	64,127	1,768	1,666	30·85	38·49
60 — 65	42,847	51,938	1,931	2,015	22·19	25·77
65 — 70	30,923	40,414	1,942	2,242	15·92	18·02
70 — 75	20,945	28,615	2,138	2,620	9·79	10·92
75 — 80	11,009	15,660	1,627	2,135	6·76	7·33
80 — 85	4,452	6,817	994	1,452	4·47	4·69
85 — 90	1,214	1,988	352	561	3·45	3·54
above 90	268	468	102	207	2·62	2·26
Of all ages,	1,564,611	1,683,457	40,147	39,266	38·97	42·87

The Numbers of Births during the same Five Years were,

Males.	Females.	Both.
275,599	263,812	539,411

Mortality, Law of.

Mortality, Law of.

TABLE II.

Exhibiting the Law of Mortality which prevailed in all Sweden and Finland, during the Five Years ending with 1805.

Age.	Males.		Females.		Both.		Age.	Age.	Males.		Females.		Both.		Age.
	Number who annually complete that year.	Number who annually die in their next year.	Number who annually complete that year.	Number who annually die in their next year.	Number who annually complete that year.	Number who annually die in their next year.			Number who annually complete that year.	Number who annually die in their next year.	Number who annually complete that year.	Number who annually die in their next year.	Number who annually complete that year.	Number who annually die in their next year.	
0	10,219	2064	9,781	1712	10,000	1888	0	50	4,540	103	4,754	83	4,647	93	50
1	8,155	481	8,069	426	8,112	453	1	51	4,437	108	4,671	88	4,554	98	51
2	7,674	266	7,643	244	7,659	256	2	52	4,329	109	4,583	88	4,456	98	52
3	7,408	181	7,399	174	7,403	177	3	53	4,220	109	4,495	90	4,358	100	53
4	7,227	136	7,225	125	7,226	130	4	54	4,111	109	4,405	92	4,258	101	54
5	7,091	117	7,100	105	7,096	112	5	55	4,002	110	4,313	97	4,157	103	55
6	6,974	89	6,995	81	6,984	84	6	56	3,892	116	4,216	102	4,054	109	56
7	6,885	70	6,914	65	6,900	68	7	57	3,776	122	4,114	106	3,945	114	57
8	6,815	59	6,849	52	6,832	56	8	58	3,654	127	4,008	110	3,831	118	58
9	6,756	50	6,797	45	6,776	47	9	59	3,527	130	3,898	115	3,713	123	59
10	6,706	40	6,752	39	6,729	39	10	60	3,397	136	3,783	124	3,590	130	60
11	6,666	37	6,713	34	6,690	36	11	61	3,261	137	3,659	131	3,460	134	61
12	6,629	35	6,679	31	6,654	33	12	62	3,124	137	3,528	135	3,326	136	62
13	6,594	33	6,648	30	6,621	31	13	63	2,987	133	3,393	138	3,190	136	63
14	6,561	33	6,618	31	6,590	32	14	64	2,854	140	3,255	142	3,054	140	64
15	6,528	35	6,587	34	6,558	35	15	65	2,714	143	3,113	146	2,914	145	65
16	6,493	35	6,553	34	6,523	35	16	66	2,571	142	2,967	148	2,769	145	66
17	6,458	36	6,519	36	6,488	35	17	67	2,429	147	2,819	151	2,624	149	67
18	6,422	36	6,483	36	6,453	37	18	68	2,282	150	2,668	155	2,475	153	68
19	6,386	41	6,447	39	6,416	39	19	69	2,132	159	2,513	160	2,322	159	69
20	6,345	45	6,408	39	6,377	43	20	70	1,973	168	2,353	169	2,163	168	70
21	6,300	48	6,369	40	6,334	43	21	71	1,805	163	2,184	178	1,995	171	71
22	6,252	49	6,329	41	6,291	46	22	72	1,642	158	2,006	177	1,824	168	72
23	6,203	49	6,288	42	6,245	45	23	73	1,484	155	1,829	179	1,656	166	73
24	6,154	49	6,246	42	6,200	45	24	74	1,329	153	1,650	175	1,490	165	74
25	6,105	48	6,204	44	6,155	47	25	75	1,176	147	1,475	169	1,325	158	75
26	6,057	48	6,160	45	6,108	46	26	76	1,029	135	1,306	156	1,167	145	76
27	6,009	48	6,115	46	6,062	47	27	77	894	124	1,150	143	1,022	133	77
28	5,961	49	6,069	46	6,015	47	28	78	770	113	1,007	141	889	127	78
29	5,912	50	6,023	48	5,968	50	29	79	657	104	866	132	762	118	79
30	5,862	50	5,975	49	5,918	49	30	80	553	97	734	125	644	112	80
31	5,812	51	5,926	50	5,869	50	31	81	456	89	609	112	532	100	81
32	5,761	52	5,876	52	5,819	52	32	82	367	78	497	96	432	87	82
33	5,709	52	5,824	54	5,767	54	33	83	289	62	401	87	345	74	83
34	5,657	54	5,770	55	5,713	54	34	84	227	53	314	70	271	62	84
35	5,603	55	5,715	55	5,659	55	35	85	174	41	244	62	209	52	85
36	5,548	56	5,660	57	5,604	56	36	86	133	34	182	44	157	38	86
37	5,492	58	5,603	57	5,548	58	37	87	99	25	138	34	119	30	87
38	5,434	60	5,546	59	5,490	60	38	88	74	21	104	25	89	23	88
39	5,374	64	5,487	60	5,430	61	39	89	53	15	79	20	66	17	89
40	5,310	67	5,427	62	5,369	65	40	90	38	11	59	18	49	15	90
41	5,243	69	5,365	67	5,304	68	41	91	27	8	41	14	34	11	91
42	5,174	70	5,298	69	5,236	70	42	92	19	6	27	11	23	9	92
43	5,104	72	5 229	69	5,166	70	43	93	13	5	16	7	14	5	93
44	5,032	74	5,160	69	5,096	71	44	94	8	3	9	4	9	4	94
45	4,958	76	5,091	65	5,025	71	45	95	5	2	5	2	5	2	95
46	4,882	79	5,026	64	4,954	72	46	96	3	1	3	1	3	1	96
47	4,803	83	4,962	65	4,882	73	47	97	2	1	2	1	2	1	97
48	4,720	86	4,897	68	4,809	78	48	98	1	1	1	1	1	1	98
49	4,634	94	4,829	75	4,731	84	49								

Mortality, Law of.

Mortality, Law of.

TABLE III.

According to the Law of Mortality that prevailed in all Sweden and Finland during the Five Years ending with 1805.

Age.	Years in the average future Duration, or Expectation of Life.			Age.
	Males.	Females.	Both.	
0	37·820	41·019	39·385	0
5	48·987	51·046	50·014	5
10	46·681	48·570	47·629	10
15	42·888	44·727	43·809	15
20	39·051	40·905	39·980	20
25	35·486	37·167	36·330	25
30	31·853	33·494	32·684	30
35	28·208	29·901	29·063	35
40	24·622	26·353	25·495	40
45	21·189	22·924	22·066	45
50	17·901	19·367	18·651	50
55	14·968	16·087	15·550	55
60	12·173	12·978	12·598	60
65	9·606	10·220	9·933	65
70	7·255	7·698	7·497	70
75	5·509	5·784	5·665	75
80	4·095	4·221	4·165	80
85	3·230	3·230	3·230	85
90	2·553	2·263	2·357	90
95	1·700	1·700	1·700	95

TABLE IV.

Showing the Number of Years in the Expectation of Life at every fifth year of age, from birth to 90 *years, according to different Tables of Mortality.*

Age.	MORE CORRECTLY.						Age.	LESS CORRECTLY.						Age.
	A	B	C	D	E	F		M	N	O	P	Q	R	
	Carlisle.	Equitable Assurance Society.	Deparcieux's Annuitants.	Sweden and Finland.				Montpellier.	Chester.	Geneva. M. Mallet.	Mankind in general. Lambert.	Breslaw.	Northampton.	
				1755–76	1775–95	1801–5.								
0	38·72	…	…	34·42	36·12	39·39	0	25·36	36·70	40·18	29·00	…	25·18	0
5	51·25	…	48·25	46·79	47·92	50·01	5	45·40	45·32	46·56	42·20	41·25	40·84	5
10	48·82	48·32	46·83	45·07	46·16	47·63	10	45·45	43·55	43·67	40·90	40·42	39·78	10
15	45·00	45·03	43·50	41·64	42·63	43·81	15	41·54	39·70	40·14	37·60	37·50	36·51	15
20	41·46	41·67	40·25	38·02	38·96	39·98	20	37·99	36·48	37·07	33·80	34·17	33·43	20
25	37·86	38·12	37·17	34·58	35·47	36·33	25	34·90	33·39	34·24	30·50	30·93	30·85	25
30	34·34	34·53	34·08	31·21	32·12	32·68	30	31·89	30·76	31·21	27·60	27·93	28·27	30
35	31·00	30·93	30·92	28·03	28·82	29·06	35	28·85	27·62	27·75	24·90	25·00	25·68	35
40	27·61	27·40	27·50	24·66	25·45	25·50	40	25·75	24·65	24·33	22·30	22·33	23·08	40
45	24·46	23·87	23·92	21·61	22·26	22·07	45	22 72	21·85	20·96	19·60	19·67	20·52	45
50	21·11	20·36	20·42	18·46	19·03	18·65	50	19·79	19·13	17·80	16·80	17·25	17·99	50
55	17·58	16·99	17·25	15·53	15·90	15·55	55	16·98	16·33	14·86	14·20	14·83	15·58	55
60	14·34	13·91	14·25	12·63	12·85	12·60	60	14·44	13·28	12·11	11·80	12·42	13·21	60
65	11·79	11·13	11·25	10·10	10·19	9·93	65	12·12	11·37	9·76	9·90	9·93	10·88	65
70	9·18	8·70	8·67	7·72	8·01	7·50	70	9·90	8·43	7·81	8·20	7·58	8·60	70
75	7·01	6·61	6·50	5·91	6·27	5·67	75	7·88	7·70	5·96	6·50	5·58	6·54	75
80	5·51	4·75	4·67	4·28	4·85	4·17	80	5·86	5·32	4·72	5·70	4·50	4·75	80
85	4·12	3·39	3·17	3·23	3·84	3·23	85	4·07	4·53	3·68	6·50	…	3·37	85
90	3·28	2·56	1·75	2·05	3·03	2·36	90	3·62	2·98	3·46	5·00	..	2·41	90

Mortality, Law of.

TABLE V.

Exhibiting the Law of Mortality that prevailed among the whole Population of Sweden and Finland, during the five years ending with 1805, *according to two different methods of constructing tables.*

Mortality, Law of.

Age.	MORE CORRECTLY. A: Number who complete that year of age.	MORE CORRECTLY. B: Number who die in their next year.	LESS CORRECTLY. C: Number who die in their next year.	LESS CORRECTLY. D: Out of the undermentioned number who complete that year by hypothesis.	E: Out of the undermentioned number who complete that year by observation.	F: Errors of the hypothesis.	Age.
0	10,000	1888	2565	10,000	13,586	3586	0
1	8,112	453	625	7,435	11,192	3757	1
2	7,659	256	365	6,810	10,920	4110	2
3	7,403	177	261	6,445	10,916	4471	3
4	7,226	130	196	6,184	10,895	4711	4
5	7,096	112	144	5,988	9,123	3135	5
6	6,984	84	106	5,844	8,813	2969	6
7	6,900	68	84	5,738	8,524	2786	7
8	6,832	56	68	5,654	8,296	2642	8
9	6,776	47	59	5,586	8,506	2920	9
10	6,729	39	49	5,527	8,454	2927	10
11	6,690	36	43	5,478	7,991	2513	11
12	6,654	33	40	5,435	8,065	2630	12
13	6,621	31	39	5,395	8,330	2935	13
14	6,590	32	39	5,356	8,032	2676	14
15	6,558	35	39	5,317	7,308	1991	15
16	6,523	35	39	5,278	7,269	1991	16
17	6,488	35	39	5,239	7,230	1991	17
18	6,453	37	40	5,200	6,976	1776	18
19	6,416	39	44	5,160	7,239	2079	19
20	6,377	43	47	5,116	6,970	1854	20
21	6,334	43	49	5,069	7,218	2149	21
22	6,291	46	50	5,020	6,838	1818	22
23	6,245	45	50	4,970	6,939	1969	23
24	6,200	45	50	4,920	6,889	1969	24
25	6,155	47	49	4,870	6,417	1547	25
26	6,108	46	49	4,821	6,506	1685	26
27	6,062	47	49	4,772	6,320	1548	27
28	6,015	47	49	4,723	6,271	1548	28
29	5,968	50	49	4,674	5,849	1175	29
30	5,918	49	50	4,625	6,039	1414	30
31	5,869	50	50	4,575	5,869	1294	31
32	5,819	52	51	4,525	5,707	1182	32
33	5,767	54	52	4,474	5,553	1079	33
34	5,713	54	53	4,422	5,607	1185	34
35	5,659	55	54	4,369	5,556	1187	35
36	5,604	56	55	4,315	5,504	1189	36
37	5,548	58	56	4,260	5,357	1097	37
38	5,490	60	57	4,204	5,216	1012	38
39	5,430	61	60	4,147	5,341	1194	39
40	5,369	65	62	4,087	5,121	1034	40
41	5,304	68	65	4,025	5,070	1045	41
42	5,236	70	67	3,960	5,011	1051	42
43	5,166	70	68	3,893	5,018	1125	43
44	5,096	71	67	3,825	4,809	984	44
45	5,025	71	66	3,758	4,671	913	45
46	4,954	72	66	3,692	4,541	849	46
47	4,882	73	67	3,626	4,481	855	47
48	4,809	78	68	3,559	4,193	634	48
49	4,731	84	73	3,491	4,111	620	49

Age.	MORE CORRECTLY. A: Number who complete that year of their age.	MORE CORRECTLY. B: Number who die in their next year.	LESS CORRECTLY. C: Number who die in their next year.	LESS CORRECTLY. D: Out of the undermentioned number who complete that year by hypothesis.	E: Out of the undermentioned number who complete that year by observation.	F: Errors of the hypothesis.	Age.
50	4,647	93	81	3,418	4,047	629	50
51	4,554	98	85	3,337	3,950	613	51
52	4,456	98	86	3,252	3,910	658	52
53	4,358	100	87	3,166	3,792	626	53
54	4,258	101	87	3,079	3,668	589	54
55	4,157	103	86	2,992	3,471	479	55
56	4,054	109	86	2,906	3,199	293	56
57	3,945	114	86	2,820	2,976	156	57
58	3,831	118	86	2,734	2,792	58	58
59	3,713	123	89	2,648	2,687	39	59
60	3,590	130	95	2,559	2,624	65	60
61	3,460	134	98	2,464	2,530	66	61
62	3,326	136	100	2,366	2,446	80	62
63	3,190	136	101	2,266	2,369	103	63
64	3,054	140	103	2,165	2,247	82	64
65	2,914	145	103	2,062	2,070	8	65
66	2,769	145	104	1,959	1,986	27	66
67	2,624	149	105	1,855	1,849	— 6	67
68	2,475	153	106	1,750	1,715	— 35	68
69	2,322	159	109	1,644	1,592	— 52	69
70	2,163	168	116	1,535	1,494	— 41	70
71	1,995	171	121	1,419	1,412	— 7	71
72	1,824	168	122	1,298	1,325	27	72
73	1,656	166	121	1,176	1,207	31	73
74	1,490	165	119	1,055	1,075	20	74
75	1,325	158	111	936	931	— 5	75
76	1,167	145	101	825	813	— 12	76
77	1,022	133	94	724	722	— 2	77
78	889	127	87	630	609	— 21	78
79	762	118	82	543	530	— 13	79
80	644	112	77	461	443	— 18	80
81	532	100	69	384	367	— 17	81
82	432	87	62	315	308	— 7	82
83	345	74	55	253	256	3	83
84	271	62	47	198	205	7	84
85	209	52	38	151	153	2	85
86	157	38	28	113	116	3	86
87	119	30	21	85	83	— 2	87
88	89	23	15	64	58	— 6	88
89	66	17	12	49	47	— 2	89
90	49	15	9	37	29	— 8	90
91	34	11	7	28	22	— 6	91
92	23	9	6	21	15	— 6	92
93	14	5	5	15	14	— 1	93
94	9	4	4	10	9	— 1	94
95	5	2	3	6	8	2	95
96	3	1	2	3	6	3	96
97	2	1	1	1	2	1	97
98	1	1	0	0	0	0	98

Mortality, Law of Mortar.

TABLE VI.

Exhibiting the Expectation of Life in Sweden and Finland, both according to Columns A *and* D *of the preceding Table.*

Age.	A. More Correctly.	D. Less Correctly.	Age.
	Expectation of Life.		
0	39·385	30·863	0
5	50·014	45·719	5
10	47·629	44·361	10
15	43·809	41·019	15
20	39·980	37·531	20
25	36·330	34·299	25
30	32·684	30·983	30
35	29·063	27·650	35
40	25·495	24·382	40
45	22·066	21·294	45
50	18·651	18·159	50
55	15·550	15·384	55
60	12·598	12·562	60
65	9·933	9·978	65
70	7·497	7·536	70
75	5·665	5·752	75
80	4·165	4·259	80
85	3·232	3·361	85
90	2·357	2·770	90
95	1·700	1·167	95

Mortality, Law of Mortlake.

TABLE VII.

Exhibiting the Increase of the Total Population of Sweden and Finland, and the Decrease of the Absolute Number above 90 *Years of Age, as well as of the Proportion of the whole Population above that Age, throughout the latter half of the Eighteenth Century.*

In the Year.	Total Population of Sweden and Finland.	Number above 90 years of age.	That is, of 1,000,000	Who were born between the years
1757	2,323,195	1609	693	1657 and 1667
1760	2,367,598	1574	665	1660 — 1670
1763	2,446,394	1515	619	1663 — 1673
Mean No. between 1776 and 1780	2,706,757	1082	400	1676 — 1690
1781 — 1785	2,823,826	1014	359	1681 — 1695
1786 — 1790	2,884,834	1072	372	1686 — 1700
1791 — 1795	2,974,447	907	305	1691 — 1705
In 1800	3,182,132	637	200	1700 — 1710
In 1805	3,320,647	837	252	1705 — 1715
	In Sweden alone.			
1810	2,377,851	574	241	1710 and 1720
	Total population of the Spanish Dominions in the Old World.			In inserting the dates in this column, those who survived 100 years have been neglected, as inconsiderable in comparison with the rest.
1797	10,541,221	4549	432	
	In the Canary Islands only.			
1797	173,865	155	892	

(A. A.)

MORTAR, a preparation of lime and sand mixed with water, which serves as a cement, and is used by masons and bricklayers in building walls of stone and brick.

MORTAR, a chemical utensil, very useful for the division of bodies, partly by percussion and partly by grinding. Mortars have usually the form of an inverted bell. The matter intended to be pounded is put into them, and there struck and bruised by a long instrument denominated a pestle. The motion given to the pestle ought to vary according to the nature of the substances to be pounded. Those which are easily broken, or which are apt to fly out of the mortar, or which are hardened by the stroke of the pestle, require that this instrument should be moved circularly, rather by grinding or bruising than by striking. Those substances which are softened by the heat occasioned by rubbing and percussion require to be pounded very slowly. Lastly, those which are very hard, and which are not capable of being softened, are easily pounded by repeated strokes of the pestle; they require no bruising but when they are brought to a certain degree of fineness. But these things are better learned by habit and practice than by any directions.

MORTAR, in the military art, is a short cannon of a large bore, with chambers; it is made of brass or iron, and its use is to project hollow shells, filled with powder, called bombs, and sometimes also carcasses. (See ARTILLERY.) The mortars used at sea are fixed in bomb-vessels, which are constructed for their reception; they are made somewhat longer and much heavier than those employed on land. See GUNNERY.

MORTARA, a province of the duchy of Piedmont, in the continental dominions of Sardinia. It extends over 378 square miles, and comprehends one city, eighty-four towns and villages, and 56,840 inhabitants. It was formerly a part of Milan, and then was denominated Lumellina. It is a level district, watered by the Po, the Ticino, and the Sesia, with their tributary streams, which irrigate the land abundantly, and cause it to yield much rice, which, with silk, forms the chief product. The capital is a city of the same name, and is surrounded with walls. It is situated in a most insalubrious district, much affected by miasmata, and contains only 2850 inhabitants. Long. 9. 11. E. Lat. 45. 16. N.

MORTIER, an ensign of dignity, which was borne by the chancellor and grand presidents of the parliament of France. That borne by the chancellor consisted of a piece of cloth of gold, edged and turned up with ermine; that borne by the first president was a piece of black velvet edged with a double row of gold lace.

MORTISE, or MORTOISE, in carpentery, &c. a kind of joint wherein a hole of a certain depth is made in a piece of timber, which is intended to receive another piece called a *tenon*.

MORTLAKE, a parish of the county of Surrey, in the hundred of Brixton, seven miles from London. It is beautifully situated on the south bank of the Thames, and includes several splendid houses, and a part of the royal park of Richmond. The inhabitants amounted in 1801 to 1748, in 1811 to 2021, in 1821 to 2484, and in 1831 to 2698.

Mortmain. MORTMAIN, or ALIENATION *in Mortmain* (*in mortua manu*), is an alienation of lands or tenements to any corporation, sole or aggregate, ecclesiastical or temporal. But these purchases having been chiefly made by religious houses, in consequence of which the lands became perpetually inherent in one dead hand, this occasioned the general appellation of *mortmain* to be applied to such alienations, and the religious houses themselves were principally considered in framing the statutes of mortmain. In deducing the history of these statutes, it will be matter of curiosity to observe the great address and subtle contrivance of the ecclesiastics, in eluding from time to time the laws in being, and the zeal with which successive parliaments pursued them through all their finesses; how new remedies were still the parents of fresh evasions, until the legislature at last, though with difficulty, obtained a decisive victory.

By the common law any man might dispose of his lands to any other private man at his own discretion, especially when the feudal restraints of alienation were worn away. Yet in consequence of these it was always and still is necessary for corporations to have a license of mortmain from the crown, to enable them to purchase lands; for as the king is the ultimate lord of every fee, he ought not, unless by his own consent, to lose his privilege of escheats and other feudal profits, by the vesting of lands in tenants who can never be attainted or die. Such licenses of mortmain appear to have been necessary amongst the Saxons above sixty years before the Norman conquest. But, besides this general license from the king as lord paramount of the kingdom, it was also requisite, whenever there was a mesne or intermediate lord between the king and the alienor, to obtain his license also for the alienation of the specific land; and if no such license was obtained, the king or other lord might respectively enter on the land so alienated in mortmain, as a forfeiture. The necessity of this license from the crown was acknowledged by the Constitutions of Clarendon, in respect of advowsons, which the monks always greatly coveted, as forming the groundwork of subsequent appropriations. Yet such were the influence and ingenuity of the clergy, that, notwithstanding this fundamental principle, we find that the largest and most considerable donations of religious houses happened within less than two centuries after the conquest. When a license could not be obtained, they contrived that, as the forfeiture for such alienations accrued in the first place to the immediate lord of the fee, the tenant who meant to alienate should first convey his lands to the religious house, and instantly take them back again to hold as tenant to the monastery, which kind of instantaneous seisin was probably given not to occasion any forfeiture; and then, by pretext of some other forfeiture, surrender, or escheat, the society entered into those lands in right of such their newly acquired signiory, as immediate lords of the fee. But when these donations began to grow numerous, it was observed that the feudal services, ordained for the defence of the kingdom, were every day visibly withdrawn; that the circulation of landed property from man to man began to stagnate; and that the lords were curtailed of the fruits of their signiories, their escheats, wardships, reliefs, and the like. To prevent this, therefore, it was ordained by the second of King Henry III.'s great charters, and afterwards by that printed in the common statute-books, that all such attempts should be void, and the land forfeited to the lord of the fee.

But as this prohibition extended only to religious houses, bishops and other sole corporations were not included therein; and the aggregate ecclesiastical bodies, who had of their counsel the most learned men that they could get, found many means to creep out of this statute, by buying in lands which were *bona fide* holden of themselves as lords of the fee, and thereby evading the forfeiture; or by taking long leases for years, which first introduced those extensive terms, for a thousand or more years, which are now so frequent in conveyances. This produced the statute *De Religiosis*, 7 Edward I., which provided, that no person, religious or other whatsoever, should buy, or sell, or receive under pretence of a gift, or term of years, or any other title whatsoever, nor should by any art or ingenuity appropriate to himself, any lands or tenements in mortmain, upon pain of the immediate lord of the fee, or, in default of him for one year, the lords paramount, and in default of all of them, the king, entering thereon as a forfeiture. Mortmain.

This seemed to be a sufficient security against all alienations in mortmain. But as these statutes extended only to gifts and conveyances between the parties, the religious houses now began to set up a fictitious title to the land, which it was intended they should have, and to bring an action to recover it against the tenant, who, by arrangement and collusion, made no defence; and thereby judgment was given for the religious house, which then recovered the land by a sentence of law upon a supposed prior title. And thus they had the honour of inventing those fictitious adjudications of right, which afterwards became the great assurance of the kingdom, under the name of *common recoveries*. But upon this it was enacted by the second statute of Westminster, 13 Edward I. c. 32, that in such cases a jury shall try the true right of the demandants or plaintiffs to the land, and if the religious house or corporation be found to have it, they shall still recover seisin; otherwise it shall be forfeited to the immediate lord of the fee, or else to the next lord, and finally to the king, upon default of the immediate or other lord. A similar provision was made by the succeeding chapter, in case the tenants should set up crosses upon their lands, the badges of knights templars and hospitallers, in order to protect them from the feudal demands of their lords, by virtue of the privileges of those religious and military orders. And so careful was this prince to prevent any future evasions, that when the statute of *Quia emptores*, 18 Edward I., abolished sub-infeudations, and gave liberty to all men to alienate their lands to be holden of their next immediate lord, a proviso was inserted that this should not extend to authorize any kind of alienation in mortmain. When afterwards the method of obtaining the king's license by writ of *ad quod damnum* was marked out by the statute 27 Edward I. st. 2, it was further provided, by statute 34 Edward I. st. 3, that no such license should be effectual without the consent of the mesne or intermediate lords.

Yet still it was found difficult to set bounds to ecclesiastical ingenuity. For when the clergy were driven out of all their former holds, they devised a new method of conveyance, by which the lands were granted, not to themselves directly, but only to nominal feoffees for the use of the religious houses, thus distinguishing between the possession and the use, and receiving the actual profits, whilst the seisin of the land remained in the nominal feoffee, who was held by the courts of equity, then under the direction of the clergy, to be bound in conscience to account to his *cestuy que use* for the rents and emoluments of the estate. And it is to these inventions that our practitioners are indebted for the introduction of uses and trusts, the foundation of modern conveyancing. But, unfortunately for the inventors themselves, they did not long enjoy the advantage of their new device; for the statute 15 Richard II. c. 5, enacts, that the lands which had been so purchased to uses should be admortised by license from the crown, or else be sold to private persons, and that for the future uses should be subject to the statutes of mortmain, and forfeitable like the lands themselves. And as the statutes had been notoriously eluded by purchasing large tracts of land adjoining to

Mortmain.

churches, and consecrating them by the name of "churchyards," such subtle imagination was also declared to be within the compass of the statutes of mortmain. Civil or lay corporations, as well as ecclesiastical, were also declared to be within the mischief, and of course within the remedy provided by those salutary laws. Lastly, as, during the times of popery, lands were frequently given for superstitious uses, though not to any corporate bodies, or were rendered liable in the hands of heirs and devisees to the charge of obits, chantries, and the like, which were equally pernicious with actual alienations in mortmain, therefore, at the dawn of the Reformation, the statute 23 Henry VIII. c. 10, declared, that all future grants of lands for any of the purposes aforesaid, if granted for any longer term than twenty years, should be void.

But during the whole of this time it was in the power of the crown, by granting a license of mortmain, to remit the forfeiture, as far as related to its own rights, and to enable any spiritual or other corporation to purchase and hold any lands or tenements in perpetuity; a prerogative which is declared and confirmed by the statute 18 Edward III. st. 3, c. 3. But as doubts were entertained at the time of the Revolution how far such license was valid, since the king had no power to dispense with the statutes of mortmain by a clause of *non obstante*, which was the usual course, though it seems to have been unnecessary; and as, by the gradual declension of mesne signiories through the long operation of the statute of *Quia emptores*, the rights of intermediate lords were reduced to a very small compass; it was therefore provided by the statute 7 and 8 William III. c. 37, that the crown for the future, at its own discretion, might grant licenses to alienate or take in mortmain, of whomsoever the tenements might be holden.

After the dissolution of monasteries under Henry VIII. though the policy of the next successor affected to grant a security to the possessors of abbey lands, yet, in order to regain as much of them as either the zeal or timidity of their owners might induce them to part with, the statutes of mortmain were suspended for twenty years, and during that time any lands or tenements were allowed to be granted to any spiritual corporation without any license whatsoever. And long afterwards, it was enacted by the statute 17 Car. II. c. 3, that appropriators might annex the great tithes to the vicarages, and that all benefices under L.100 per annum might be augmented by the purchase of lands, without license of mortmain in either case; and the like provision has been since made in favour of the governors of Queen Anne's bounty. It has also been held, that the statute 13 Henry VIII. before mentioned, did not extend to any thing but superstitious uses, and that therefore a man may give lands for the maintenance of a school, an hospital, or any other charitable uses. But as it was apprehended, from recent experience, that persons on their deathbeds might make large and improvident dispositions even for these good purposes, and defeat the political ends of the statutes of mortmain, it was therefore enacted by the statute 9 George II. c. 36, that no lands or tenements, or money to be laid out thereon, should be given for or charged with any charitable uses whatsoever, unless by deed indented, executed in the presence of two witnesses twelve calendar months before the death of the donor, and enrolled in the Court of Chancery within six months after its execution (except stocks in the public funds, which may be transferred within six months previous to the donor's death), and unless such gift were made to take effect immediately, and were without power of revocation, and that all other gifts should be void. The two universities, their colleges, and their scholars, upon the foundation of the colleges of Eton, Winchester, and Westminster, were excepted from the operation of this act; but such exemption was granted with this proviso, that no college should be at liberty to purchase more advowsons than were equal in number to one moiety of the fellows or students upon the respective foundations.

Morton Hampstead ‖ Mosaic Law.

MORTON HAMPSTEAD, a town of the county of Devon, in the hundred of Teignbridge, 184 miles from London. It stands in a picturesque situation at the foot of Dartmoor Hills. It is an ancient corporate town, and has a market on Saturday, with some natural curiosities worthy of observation, especially by the geologist. The population amounted in 1801 to 1768, in 1811 to 1653, in 1821 to 1932, and in 1831 to 1864.

MORUNG, a district of Northern Hindustan, tributary to the rajah of Nepaul, situated about the 27th degree of north latitude, and bounded on the south by Bengal. It is a mountainous country, being in some parts 7000 feet higher than Bengal; and it produces very fine timber, but is yet imperfectly explored.

MORWARA, a town of Hindustan, in the province of Gujerat, governed by a Rajpoot chief. The surrounding country is frequently plundered by the Coolies. It is thirty miles south-south-west from Theraud.

MOS, a bailiwick of the province of Aggerhuus, in Norway, containing 19,800 inhabitants. The chief town, of the same name, is situated on the Bay of Christiania, and contains 400 houses, with 1408 inhabitants, who make much bar, rod, and cast iron.

MOSAIC LAW, the code of laws delivered to the Israelites by Moses. This is the most remarkable system of jurisprudence ever given to the world, as well as the most ancient of which we have any distinct record. It was delivered, not to a settled nation, but to a people on their way to a settlement at that time inhabited by numerous and powerful clans, from whom, and from all other nations whatsoever, it was one of the main objects of the law to separate and distinguish them; and when they had reached the promised land, it was, with scarcely any alteration, found equally adapted to the people after they had subjugated the hostile bands by which they were surrounded, and were living in victorious peace amidst the trade and bustle, the pomp and magnificence, of a great monarchy. Nor is this all. Its decalogue, or ten commandments, has been adopted by the most enlightened nations as the moral law of human nature. These precepts, too, were not promulgated at different times according as circumstances seemed to dictate, like the Koran of a later age, but were given at once, along with the other principles of the system; which exhibits a unity of character and a singleness of purpose peculiar to itself. It must be added, that throughout the whole code there evidently appears an end and object, which, like the vital fluid meandering in our veins, imparts to the system all its freshness, life, and vigour, and which being withdrawn or accomplished, the body is left in the weakness and stillness of death.

The Mosaic or Jewish law is generally said to be comprehended in these three particulars; namely, the decalogue, or ten commandments, the judicial law, and the ordinances of divine service, or the ceremonial law. But it was certainly not so considered by the Jews themselves, nor by their lawgiver. The basis upon which the whole law rested was historical. It was this: That God had chosen the progenitor of the nation from amongst his idolatrous kinsmen, to impart to him and his posterity a knowledge of the true God, and establish them in the land to which the nation was now advancing, to be there governed by this law. The very first words of the decalogue are, "I am the Lord thy God, which brought thee out of the land of Egypt, out of the house of bondage; thou shalt have no other Gods before me." And, with the eye of faith, the believing Jew could look forward to the distant future, and anticipate the time when there should "come forth a rod out of the stem of Jesse, and a branch grow out of his roots,"—

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when a new seed should arise to serve Jehovah, not after the law of a carnal commandment, but after the power of an endless life; and in the still remoter future see a heavenly Canaan, wherein "the ransomed of the Lord" should be found gathered out of every kindred, and tongue, and people, and nation, and God should be all in all.

The Hebrew community, as it existed in the time of Moses, was placed under a theocracy, in the strictest sense of that term. The fundamental principle of their law was the recognition and obeying of God as the only true God, and in particular as their sovereign; the law issued from his mouth; and the whole Jewish judges, magistrates, and officers, were merely his deputies, to announce to the people, or execute upon them, the divine promises and threatenings, with a certainty like that of the laws of nature, of which, indeed, the laws of the Hebrew commonwealth might reasonably enough be regarded as but a part.

The principal copy of the law was committed to the custody of the priests and elders,[1] that is to say, the joint care of the civil and ecclesiastical powers; it was appointed to be publicly read and expounded to the people at stated solemnities, "when all Israel was assembled together;"[2] parents were commanded to teach and impress it upon their families and households;[3] and it came to be customary also to read and expound it every Sabbath-day in the synagogues.[4]

The great principles of the Mosaic code are piety and mercy, love to God,[5] and love to man;[6] and all the precepts of the law are either deductions from these two first principles, or ordinances explanatory of how their end was to be attained. On these two commandments hang all the law and the prophets.[7]

Let us now consider the several parts of the law. And, first,

The DECALOGUE, or TEN COMMANDMENTS.—By these[8] it was enjoined on the people, 1. That there is no other God but the Lord God, that brought them out of the land of Egypt: 2. That no image or likeness of any creature whatever is to be made, as the divine likeness, or for divine worship; implying the entire separation of the Deity from all created beings, and his exclusive right to their worship and adoration: 3. That the name of God is not to be taken in vain, that is to say, either lightly, or to a falsehood; implying the divine omniscience and power: 4. That the seventh day is to be observed as a day of rest for all persons and for all cattle within the Jewish territory, to restore them after their previous toils, and, at the same time, to keep alive in the world a sense of the creation of all things, and their great Creator: 5. That parents are to be honoured: 6. That the life of man is not to be attacked: 7. That the relation of husband and wife is not to be disturbed: 8. That the property of others is not to be violated: 9. That false testimony is not to be borne: and, 10. That covetousness, and all risings of envy, are to be avoided and repressed.

Slavery.

The JUDICIAL or CIVIL LAW was next delivered to the nation; and here the first object which attracted the notice of the great lawgiver was the Hebrew slave, upon whom was immediately conferred the boon of an everlasting Sabbath. "If thou buy a Hebrew servant, six years shall he serve, and in the seventh he shall go out free for nothing."[9] The practice of slavery existed before the law, and persons might become slaves, *first*, by captivity or subjugation in war;[10] *secondly*, by purchase,[11] the chief occasions of which were debt[12] and theft;[13] and, *thirdly*, by accession of issue to the owner of a slave mother.[14] But, under the Mosaic law, slavery was divested, we may say, of all its horrors; for the slave was entitled to be treated at once as a sentient, a rational, and an immortal creature. He enjoyed the common benefit of the Sabbath[15] and other great national festivals;[16] if a Hebrew, he was to be treated like a hired servant, that is to say, without rigour;[17] personal maltreatment operated his release;[18] and, in all cases, a master was indictable for killing his slave, if the latter died under his hand.[19] The escape of a slave even operated his release, those to whom he ran being forbidden to deliver him up again.[20] We have seen also, in the case of a purchased Hebrew slave, that the service properly continued six years, and no more; in the seventh year he behoved to be liberally furnished "from the flock, the floor, and the wine-press," and set free, alone if he came alone, with his wife if he came married. But if his wife was given him by his master, she and her children remained the master's.[21] A purchased Hebrew female does not appear to have had the benefit of the seventh year; but there was a peculiarity in the case of her being betrothed to her master, for then he could not sell her to a foreign nation;[22] and where a female slave was betrothed to the master's son, she became, as it were, a daughter in the house, and if the engagement was not completed by marriage, she was entitled to her freedom.[23] There was but one case of perpetual bondage. It was when a slave, having married a female given him by his master, or having become attached to his master's home, preferred remaining in his house rather than accepting the freedom of the year of release. In that case the man was taken before a magistrate, and had his ear bored in token of perpetual service.[24] But this was plainly a sacrifice to the best feelings of our nature; and it furnished the royal psalmist, and him of whom David was a type, with an affecting emblem of devotion to the divine will.[25]

Husband and wife.

The learned Selden remarks three modes of contracting marriage amongst the Jews, viz. *argento seu nummulo dato*, *pactionis libello*, and *coitu*.[26] Under this last mode is to be ranked seduction of an unbetrothed female, which operated as a marriage,[27] without liberty of divorce.[28] There were two other compulsory marriages. The one was where, a man having died leaving a widow without issue, his brother was obliged to take the place of the deceased;[29] and the other was where daughters, who were co-heiresses, were obliged to marry within their tribe, that the inheritance might not be severed from it. The reason of the other regulation, which indeed existed before the law,[30] was to maintain the line of the deceased; and both sorts were wisely adapted for a people out of whom the Messiah was to arise. The power of a husband was great; he could disallow or annul his wife's vows; he could bring her at any time before the priest for trial by the waters of jealousy;[31] and he appears to have had an arbitrary

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[1] Deut. xxxi. 9.
[2] Ibid. xxxi. 10–14.
[3] Ibid. vi. 6–9; xi. 18–22.
[4] Acts, xv. 21.
[5] Deut. vi. 5.
[6] Levit. xix. 18.
[7] Matth. xxii. 40.
[8] Exod. xx. 1–18.
[9] Ibid. xxi. 2.
[10] Deut. xx. 10, et seq.
[11] Exod. xxi. 2–7; Deut. xv. 12.
[12] Levit. xxv. 39; 2d Kings iv. 1; Matth. xviii. 25.
[13] Exod. xxii. 3.
[14] Ibid. xxi. 4.
[15] Ibid. xx. 10; Deut. v. 14.
[16] Deut. xii. 17, 18; xvi. 11.
[17] Levit. xxv. 39, et seq.
[18] Exod. xxi. 26, 27.
[19] Ibid. xxi. 20, 21.
[20] Deut. xxiii. 15, 16.
[21] Exod. xxi. 2–5; Deut. xv. 12, et seq.
[22] Exod. xxi. 7, 8.
[23] Ibid. xxi. 9.
[24] Ibid. xxi. 5, 6.
[25] Psalm xl. 6; Hebr. x. 5.
[26] Selden, Ux. Hebr. lib. ii. c. i.
[27] Exod. xxii. 16, 17.
[28] Deut. xxii. 28, 29.
[29] Ibid. xxv. 5, et seq.
[30] Gen. xxxviii. 8.
[31] Numb. v. 11, et seq.

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power of divorce,[1] this last being,[2] we have the highest authority for saying, a concession to the habits and circumstances of the people.

Parent and child.

The same power of disallowing vows was possessed by parents,[3] whose authority in general was, like that of a husband, very great indeed. A father might sell his daughter as a slave ;[4] and we find, that as Abraham before the law was about to offer up his son in sacrifice, so Jephtha under the law actually offered up his daughter. A father seems also to have had power to dispose of his daughters in marriage ;[5] and all injuries done to a daughter living in her father's house were repaired to the father. Reverence to parents was indeed a peculiar characteristic of the Mosaic law. They were the sovereigns of their family, its priest, and its prophet, which last office they particularly filled when they stored the minds of their household with the knowledge of their national history and law, which, whilst it taught them their filial duty, taught them also their relation to the Great Parent of all. A first-born son had some peculiar privileges over the other children of the family; as dedication to God,[6] and a double portion of his father's goods as inheritance.[7]

Inheritance.

The principle of the law of *inheritance* was early stated; but its several steps were not brought out till forty years after the promulgation of the law, in the case of the daughters of Zelophehad. The course of descent was this. The estate passed first to the children of the deceased, preferring sons to daughters, and allowing the first-born son a double portion of his father's goods. On failure of children, the estate fell to the brothers of the deceased, next to his father's brothers, and, lastly, to the nearest kinsman of the family.

Deposit.

In the case of *deposit*, if the thing deposited, money or goods, was stolen, and the thief was not discovered, all that was required of the depositary was, to swear that he had not acted wrongfully in the matter; except in the case of cattle, when he was bound to make restitution, or show that the animal had been torn in pieces by wild beasts.[8]

Hiring.

A *hired* thing, hurt or dying in the hand of the hirer, needed not be made good; the hire stood for it.[9]

Loan.

In the case of *loan*, if the thing borrowed was hurt or died, the owner being present, the borrower was not bound to make it good; but otherwise, if the owner was absent.[10] The case of a money loan was peculiar; interest might be taken from foreigners, but not between Jews.[11] The general policy of the Hebrew code was to preserve moderation of means in individuals, and a general equality throughout the nation; and this seems to have been the particular policy of the Hebrew law of interest. For by the regulation disallowing interest, coupled with the regulation, to be immediately noticed, that debts were released at the Sabbatical year, the loan of money was made difficult of attainment, and so the spirit of speculation, no less than the contracting of debt, was prevented.

Pledge.

The same principle, no doubt, pervaded the law of *pledge*, so that pledges were in fact only nominal. Raiment might be taken in pledge, but, like all pledges from the poor,[12] it required to be returned before night.[13] The goods of a widow could not be taken in pledge at all ;[14] nor the upper or nether millstone,[15] by which we are probably to understand any implement whatever of trade or handicraft. In such a state of society we cannot wonder at the absence of all provision in regard to *suretyship*.

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Various provisions were made in the law for the regaining of rights which had been conveyed away. All lands and houses were sold with a power of redemption; every fiftieth year was a year of jubilee for the restoration of lands other than common burghal tenements,[16] and the discharge of all incumbrances ;[17] and every seventh year was a year of release from all debts and personal services.[18] It was also a Sabbatical year, or year of rest to the land, wherein the land was neither sown nor reaped, but its natural produce was common to all. The reason of these agrarian laws we have in Leviticus, xxv. 23: "The land shall not be sold for ever, for it is mine, saith the Lord; and ye are strangers and sojourners with me."

Agrarian laws.

The benevolent sentiments were anxiously and impressively inculcated.[19] Mercy, indeed, was, as we have seen, one of the first principles of the law; and in the appointment of the Sabbath the Jew was continually reminded of the divine compassion towards even the beasts of the field, who had thus secured to them a weekly intermission from their labours. Mercy was to be shown to every Jew, as to "a brother," and whether he were a friend or a foe; and all oppression was forbidden towards strangers, for, says the divine lawgiver, "ye were strangers in the land of Egypt, and know the heart of a stranger;"[20] and towards the widow and fatherless, for "if thou afflict them in any wise, and they cry at all unto me, I will surely hear their cry; and your wives shall be widows, and your children fatherless."[21]

Punishments.

The Mosaic *punishments* were not very various. Recompense was sometimes enjoined, by restitution, by compensation, and by fines. The principle of retaliation was frequent, "eye for eye, tooth for tooth, and beast for beast;" but the most common award was death, "to cut off the offender from among the people," and preserve the community from the moral contagion of his example. Striking, cursing, or continuing obstinately disobedient to a parent, was punished in this way ;[22] as were also man-stealing, with intent to sell or reduce to slavery,[23] murder,[24] blasphemy,[25] idolatry and false worship,[26] sabbath breaking,[27] witchcraft and sorcery,[28] sodomy and bestiality,[29] incest,[30] adultery,[31] fornication,[32] and lewdness,[33] all of which crimes were punished with death.

Pardon.

Nor was there any provision in the law for the *pardon* of offenders, or any power lodged any where for that purpose. The law was imperative and inexorable, excepting only in the case of casual homicide, for which six cities of refuge were provided throughout the land, that the manslayer might flee thither and be safe.[34]

Ceremonial law.

The last branch of the code is the CEREMONIAL LAW, or *ordinances of divine service*. The situation of the Jews in relation to the Deity was singular. They were, in a pre-

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[1] Deut. xxiv. 1.

[2] That is to say, if we take the passage in the sense contended for by some of the rabbis, and which seems to have been the commonly received interpretation; but others of the rabbis held it allowed divorce not for any cause but for unchastity only.

[3] Numb. xxx. 2, et seq.
[4] Exod. xxi. 7.
[5] Ibid. xxii. 17; Deut. xxii. 16.
[6] Ibid. xxii. 29.
[7] Deut. xxi. 17.
[8] Exod. xxii. 8.
[9] Ibid. xxii. 15.
[10] Ibid. xxii. 14, 15.
[11] Ibid. xxii. 25.
[12] Deut. xxiv. 12, 13.
[13] Exod. xxii. 26.
[14] Deut. xxiv. 12, 17.
[15] Ibid. xxiv. 6.
[16] Levit. xxv. 30, 32, 33.
[17] Ibid. xxv. 10, 13, et seq.
[18] Exod. xxi. 2, et seq.; Deut. xv. 1, 2, 12.
[19] Ibid. xxiii. 4, et seq.; Deut. xxii. 1, et seq.
[20] Ibid. xxii. 21.
[21] Ibid. xxii. 22.
[22] Ibid. xxi. 15, 17; Deut. xxi. 18.
[23] Ibid. xxi. 16.
[24] Ibid. xxi. 12.
[25] Levit. xxiv. 10, et seq.
[26] Exod. xxii. 20; Deut. xvii. 2.
[27] Exod. xxxv. 2; and see Numb. xv. 36.
[28] Ibid. xxii. 18; Levit. xx. 27.
[29] Ibid. xxii. 19; Levit. xx. 13, et seq.
[30] Levit. xviii. 29, xx. 14.
[31] Ibid. xxi. 10; Deut. xxii. 22.
[32] Deut. xxii. 20, 21.
[33] Levit. xx. 17.
[34] Exod. xxi. 13, 14; Numb. xxxv. 6, et seq.; Deut. xix. 1, et seq.

Mosaic Law.

eminent sense, "a peculiar people, above all the nations of the earth;"[1] and as the nation and the land of Israel were denominated *holy*, so other nations were called *polluted* and *unclean*,[2] "aliens from the commonwealth of Israel, and strangers to the covenants of promise." But though this was the case nationally considered, there were certain things which *defiled* a Jew, and rendered him *unclean*. The first notice which we have of this is in the judicial law, where it is said, "ye shall be a holy people unto me; neither shall ye eat any flesh torn of beasts in the field; ye shall cast it to the dogs."[3] But the several occasions of defilement are stated at large in that branch of the code which we are now considering;[4] where we find that leprosy in the person, in garments, or in a house, rendered these respectively unclean, and that, amongst other things, certain animals, beasts, fishes, fowls, and reptiles, were unclean. The defilement contracted was sometimes but temporary, and ceased with the morning's ablution; at other times it could be removed only in the way prescribed by the law.

The tabernacle.

There were also certain persons, places, and times, which were accounted peculiarly holy. The holy place *par excellence* was the tabernacle, the outer court of which occupied a space of one hundred cubits in length by fifty in breadth, or about one hundred and eighty feet by ninety. The only entrance to this court was from the east by a hanging rail of blue, purple, scarlet, and fine-twined linen. Here, under the open sky, stood a laver of brass for the priests to wash in, and the altar of burnt-offering. Into this court every clean Hebrew or proselyte of the covenant might enter with his offerings. At the west end of this court stood a close tent about fifty-four feet in length by eighteen in breadth, which was properly called the tabernacle, and divided into two apartments. The first, which St Paul calls the *first* tabernacle, was about thirty-six feet in length, and contained the shew-bread, the candlestick of pure gold, &c.; and into this, which was denominated *the holy place*, only the priests durst enter or look. Beyond this apartment was another about eighteen feet square, called the *second* tabernacle, most holy place, or Holy of Holies, which was separated from the first tabernacle by a veil of embroidered linen hung upon pillars of wood overlaid with gold. Here stood the ark of the covenant. It was made of wood overlaid with gold, and contained the book of the testimony. Upon the ark, and of like dimensions with it, was the mercy-seat, of pure gold, with a cherub of beaten gold on either side, stretching its wings over the mercy-seat, the face of the cherubim being towards each other. It was from above the mercy-seat, and between the cherubim, that God met and communed with Moses and the high priest; none else was permitted to enter the sacred precincts, and even the high priest could only do so once a year, and this not without blood, which he offered for himself and for the errors of the people.

Priests.

The *priesthood* was in the family of Aaron. The priests served at the altar, prepared the victims, and offered the sacrifices; they kept up the fire upon the altar of burnt-offerings, and in the lamps of the golden candlesticks; they kneaded, baked, and offered the shew-bread; they publicly blessed the people, and were consulted by them as the interpreters of the law, and judges of controversies; and, in time of war, they carried the ark and sounded the trumpets. Their garments, which were specially prescribed in the law, were a tiara, a girdle, a linen tunic, and linen drawers. The high priest had a plate or crown of gold on his tiara, with the inscription, "Holiness to the Lord." He had also the square breastplate of judgment, with its twelve stones containing the names of the twelve tribes, and the Urim and Thummim fixed in the breastplate; the ephod having on the shoulders two onyx stones, whereon were also engraved the names of the children of Israel; the blue robe of the ephod with golden bells hung to the skirt to sound when the high priest walked in and out from the holy place; and, lastly, the high priest's coat.

Mosaic Law.

Levites.

The *Levites*, who were consecrated to God, instead of the first-born of the nation, were assigned to the priests, to wait upon them, to serve the tabernacle, to carry it, to encamp round it, and to minister in relation to it. They were divided into three classes, from the three sons of Levi, *Gershon*, *Kohath*, and *Merari*, each of which had its own particular charge. The charge of one class was the tabernacle, and its coverings and hangings; that of another was the boards of the tabernacle, its bars, pillars, and sockets; and that of the third was to bear "the most holy things," that is to say, the sanctuary or most holy place, and all the vessels and articles appertaining to it. But these were not to be touched by them; they were to be taken down and put up by the priests, and simply carried under cover by the bearers, and this upon their shoulders; whereas the other two classes of the Levites had, the one two waggons and four oxen, and the other four waggons and eight oxen, for their service.

Elders of Israel.

And as the Levites were appointed to assist the priests, so Moses was allowed seventy elders of Israel "to bear the burden of the people with him."

Sacred seasons.

The holy *Festivals* were the weekly Sabbath and the three great annual feasts, namely, 1. the Passover and feast of Unleavened Bread; 2. the feast of Weeks, or of the first fruits of the ground; and, 3. the feast of Tabernacles, or the gathering in of the corn and wine. The Passover was observed on the fourteenth day of the first month of the Jewish year, which began in March; and the feast of Unleavened Bread lasted the seven following days. The feast of Weeks was a moveable feast. The feast of Tabernacles was in the seventh month, or in our September. On the first day of the month, which was observed as a Sabbath, the trumpets were sounded, whence that day was called the feast of Trumpets. The tenth day, which was likewise Sabbatical, was the great day of Atonement, when every one was required to afflict his soul; and on the fifteenth day the feast of Tabernacles began, and lasted seven days. It was on the great day of Atonement also that the Jubilee was proclaimed every fiftieth year, and then every one returned to his family and possessions, and the land lay fallow for a year. All these feasts and times were specially ordered in the law; and the matter and manner of the sacrifices and offerings then to be made were therein also specially prescribed. There were other sacred seasons, such as the times of new moons; and every day the Temple was open for worship, and sacrifices and offerings were made every morning and evening.

Besides the stated sacrifices and offerings, free-will offerings were allowed; and to meet particular vows, persons were valued in the law according to their sex and age; but it was specially provided that no devoted thing should be redeemed,—"every devoted thing is most holy unto the Lord."

A few words may now be added on the history of this remarkable code. It was promulgated before the Israelites began their journey to Canaan; and they had not proceeded far on their way thither when the authority of Moses was signally vindicated, particularly on two occasions; first, when Miriam the sister of Moses was struck with leprosy for envying and speaking against Moses; and next, when Korah, grandson of Kohath, whose function was to carry "the most holy things," ambitious of a higher charge,

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[1] Deut. xiv. 2.
[2] Exod. xxii. 31.
[3] See 2 Chron. vi. 32; Psal. lxxix. 12; Isa. xxxv. 8; Amos, vii. 17; Zech. ii. 12.
[4] Levit. xi.–xv.

Mosaic ‖ Moschus.

headed a great company, who would have put down all subordination and rank, on the pretence that "all the congregation were holy, every one of them."[1] But Moses, after remonstrating with them on their rebellion, invoked on them the divine vengeance, in consequence of which they all perished. In the time of Joshua, the successor of Moses in the captaincy of Israel, the people were settled in the promised land. From Joshua's death they had no regular succession of leaders down to the time of Samuel, when they sought a king, and obtained one, first in the person of Saul, and then of David; in whose reign, that is to say, nearly five hundred years after the departure out of Egypt, a permanent Temple was erected at Jerusalem, instead of the former Tabernacle. In their internal arrangements the Temple and Tabernacle were alike, the house of God at Moriah consisting, like the Mosaic Tabernacle, of a porch or court, the temple or sanctuary, and the most holy place, or place of the oracle; but the change of the Tabernacle, which was ambulatory, to a fixed and permanent temple, occasioned the alteration on the Mosaic code to which we alluded in the beginning of this article. There was now no need for the Levites in their capacity of bearers of the tabernacle. King David, therefore, distributed the priests and the Levites into new classes, and appointed treasurers, singers, porters, and other officers. His son Solomon, also, ordered for the temple an immense molten sea, and caldrons for water for the sacrifices; and for himself a throne of ivory overlaid with gold. This was the First Temple; for, at the captivity of the last remaining tribes, it was finally destroyed; and, upon the return of the Jews under Cyrus and Darius, a new temple on the same site was erected, of which it was predicted that its glory should exceed the glory of the former. This was accomplished in the appearance there of the Messiah, the king and priest of a spiritual Israel, who has abolished the distinction between Jew and Gentile, and, having offered up himself as a sacrifice for sin, is gone into heaven itself, now to appear in the presence of God for his people, till they also be introduced into the same presence as "kings and priests." (U. U. U.)

MOSAIC, or *Mosaic Work*, an assemblage of little pieces of glass, marble, precious stones, and other substances, of various colours, cut square, and cemented on a ground of stucco, in such a manner as to imitate the colours and gradations of painting. The critics are divided as to the origin and reason of the name. Some derive it from *mosaicum*, a corruption of *musaicum*, as that is of *musicum*. Scaliger derives it from the Greek μουσα, and imagines that the name was given to this sort of works, as being very fine and ingenious. Nibricensis is of opinion that it was so called because *ex illis picturis ornabatur musca*.

MOSALSK, a circle of the Russian province of Kaluga, extending in east longitude from 36. 13. to 37. 3., and in north latitude from 53. 58. to 54. 48. The soil is generally poor; and though the circle comprehends 2310 square miles, the inhabitants are only 170,500. It contains several lakes, some of them extensive. The capital, of the same name, 614 miles distant from St Petersburg, is situated on the river Mosalka, and has 343 houses, and 1640 inhabitants. Long. 34. 45. E. Lat. 53. 35. N.

MOSCHUS, a Grecian poet of antiquity, usually coupled with Bion, and both of them contemporaries with Theocritus. In later times, all the ancient idyllia were collected and attributed to Theocritus; but the claims of Moschus and Bion to some few little pieces have been admitted, and this is sufficient to make us inquisitive about their characters and story; yet all that can now be known about them must be collected from their own remains. Moschus, by composing his delicate elegy on Bion, has given the best memorials of Bion's life. Moschus and Theocritus have by some critics been supposed to be the same person; but there are irrefragable evidences against such an hypothesis. Others, proceeding upon the authority of Suidas, maintain that he as well as Bion lived later than Theocritus, whilst others again suppose him to have been the scholar of Bion, and probably his successor in the government of the poetical school; which, from the elegy of Moschus, does not seem unlikely. Their remains are to be found in all the editions of the *Poetæ Minores*. Of the separate editions, some are very valuable, particularly the rare and curious one of Mekerchus, printed at Bruges, 1565, in 4to; and those of Schwebelius, Venice, 1746, in 4to, of Heskin, Oxford, 1748, in 8vo, and of Gilbert Wakefield, 1795, in 8vo.

Moscow.

MOSCOW, a city of European Russia, the capital of the circle and of the government of that name, and one of the two capitals of the vast Russian empire. It was long the only capital, and is still the place where the splendid ceremony of the coronation of each emperor is performed. It was first founded by Prince George I. in 1147, and vastly extended by Prince Daniel in 1300. It continued to increase till the year 1383, when it was captured by the Tartars, and nearly destroyed. It was, however, again rebuilt, and had attained some degree of prosperity, when, in 1571, it was again taken and destroyed by the same people. It soon arose from this disaster with more than its former splendour, when, in 1611, it was seized by the Poles, and almost wholly burned down; the houses being then, as at the former period, almost exclusively built of wood. It recovered from this disaster, and again became a city of vast extent, population, and wealth, all of which had made great progress under the reign of the Empress Catharine. In 1812, when Bonaparte invaded Russia, at the head of an army composed of men of nearly all the European nations, Moscow, in a circle of twenty-four miles, contained five divisions, viz. 1st, the Kremlin, containing the citadel, the imperial palace, and many other public and private buildings; 2d, Kitaigorod; 3d, Belegorod; 4th, Semlanoigorod; and 5th, the thirty Slobodes or suburbs. The whole contained 288 churches, and 10,000 houses, besides booths of wood, with a population of 350,000 persons. After the French had defeated the Russians at Borodino, it appeared necessary to the latter to offer up their capital in order to save that empire, of which it formed but an inconsiderable part. Whether the fires which broke out after the French had entered the city were kindled by that people or by the Russians themselves, has been a subject of animated contest. The fact is notorious that the Russian governor had, two days before the entrance of the enemy, removed all the fire engines, and withdrawn the firemen; and it is no less certain that a whole street, filled with magazines of carriages of all kinds, was fired by the owners of them the night after all the carriages had been put in requisition by the commissaries of the French army. On the other hand, there is the testimony of many eye-witnesses that numerous houses and wooden booths were set on fire by the French troops, from the love of plunder, from revenge, from negligence, or from not knowing how to cook their food in the intricacy of the stoves and flues of the Russian houses, which induce many fires even amongst those accustomed to their constant use. But from whichever cause it arose, more than 500 fires were kindled, and burning at the same time. The burning continued from the evening of the 15th till the 20th of September, during which time 7932 houses were laid in ashes. The Kremlin was designed to have been blown up

[1] Numb. xvi. 3.

Moscow. by the French on their evacuation of Moscow; but the plan adopted succeeded only partially. The loss of property occasioned by this catastrophe was estimated, by commissioners appointed to value it, at the sum of L.14,500,000 sterling, although many of those whose losses had been the greatest preferred no claims for indemnification.

The rapidity with which Moscow has recovered from its calamity is almost as surprising as the extent of the losses it sustained. It has been again rebuilt, and within ten years there were 11,000 houses and 25,000 inhabitants. It has continued to advance since that time, and the population in 1831 was calculated to exceed by 50,000 persons that of the year 1812, when it was destroyed. In 1826, most of the public buildings had been re-constructed. There were then in the city six cathedrals, twenty-one monasteries, 270 Greek churches, and eight for other religious sects. The Kremlin has been repaired and beautified, at an expense of 500,000 roubles; and it is improved in its appearance by the greater regularity it now presents. The university has been re-established, and the collections, especially of natural history and of anatomy, have been rendered more select and are much better arranged than formerly. The foundling hospital has been again built, and filled with several thousand children. A new and extraordinary building has been erected, and ornaments the city; it is used as a house of exercise for troops in the very severe weather. It exhibits a front of 580 feet, is forty-five feet in height, and 170 feet in breadth, and is sufficiently capacious for 2000 foot and 1000 horse soldiers to be reviewed. The foundation of a new church was laid in 1817, on the anniversary of the retreat of the French, to be dedicated to the Saviour, and which, when finished, will be the largest place of worship in Europe.

The new city being built on a regular plan, has wider and straighter streets than before; and the private buildings of stone bear a greater proportion to the whole, and exhibit more correct taste. Moscow is in winter the residence of all the great and rich noble families, and whatever splendour they may display is exhibited there. Their palaces are large, surrounded with gardens, in some cases with parks, and have now received more an Asiatic than an European appearance. Abundant amusements are to be found for the higher classes, in theatres, balls, concerts, clubs, casinos, freemasons' lodges, icebergs, sledge races, and, though last not least, at various gambling tables. There are 163 taverns, and 120 other public houses, for the reception of travellers; and no less than 607 public baths.

There are manufactures of silk, linen, woollen, and cotton, and of all the various articles of luxury which are required by the higher classes, when so rich as many are in Russia, and when but one place in a vast extent of country can supply them. There is a considerable trade carried on, first with the towns on the Baltic Sea; secondly, there is the intercourse by land with Germany; thirdly, the exchange of commodities with Persia; fourthly, the trade with Turkey; fifthly, the commerce with China by land, carried on along the frontiers of that empire; and, sixthly, the trade with Central Asia. These branches, when brought to a focus in Moscow, create great mercantile operations, and may account in some measure for the rapidity with which the re-establishment of this capital of Russia has been accomplished. It is in long. 37. 27. 40. E. and lat. 55. 45. 45. N.

Moscow, or *Moskwa*, a government in European Russia. It is so called from the river of that name, which is the most considerable stream in the province. It extends from longitude 35. 9. to 38. 35. east, and from latitude 54. 40. to 56. 30. north, and occupies 10,436 square miles. About two fifths of the surface is wood-land, nearly the same proportion is ploughed land, and the remainder consists of morasses, meadows, gardens, and the sites of the cities, towns, and villages. According to the best Russian accounts, there are within the government 15 cities, 3450 parishes, some of which may be denominated towns, 3058 villages, and 1324 noblemen's mansions and estates. The inhabitants were, in the year 1816, 1,289,823; since that period there has been a rapid increase of population, and, on a fair calculation, it amounted in 1832 to 2,600,000 individuals. These persons are almost all adherents of the Greek church, though some exceptions may be made in the capital, where there are Catholics, Lutherans, Calvinists, and Jews, who are all tolerated, and have their several religious temples. The whole of the province may be denominated a plain, though it is occasionally interspersed with gentle elevations, or with groups of hills, few of which exceed 200 feet in height. It contains abundance of lakes; according to Storch there are no less than 190, but none of these is of any considerable extent. The principal river, the Moskwa, is navigable for barges and boats. It is usually frozen from the middle of November till the end of March. The greater part of the rivulets, whether issuing from springs or from the lakes, contribute to form the stream of that river. The Volga passes through a small part of the north of the province, and the Oka through a portion of the south. Although the soil is of moderate fertility, yet as the population, thin as it is, is more dense than in any of the other provinces, it does not produce corn sufficient for the consumption, but must every year draw a supply from the adjoining districts. The same is the case with animal food, which is brought to the capital in the winter in a frozen state in great quantities. There are no mines worked in the province. The chief natural productions exported are wood and potash, but the manufactured goods are considerable. These are almost exclusively furnished by the capital, and are noticed under that head. The climate is severely cold in winter, which extends through nearly half the year. It is, however, not unhealthy. The government is divided into thirteen circles.

Moselle. MOSELLE, a department in the north-east of France, formed out of the district of Messin, of French Luxembourg, and of a part of German Lorraine. It extends in east longitude from 5. 20. to 7. 45., and in north latitude from 48. 55. to 49. 30. It is bounded on the north by the department of the Lower Rhine and the duchy of Luxembourg, on the east by that duchy and the Bavarian circle of the Rhine, on the south by the department of the Meurthe, and on the west by that of the Meuse. It extends over 2008 square miles, or 532,796 hectares, which are apportioned in the following manner, viz. 278,920 arable, 48,490 meadows and pastures, 151,365 woods and forests, 4940 vineyards, 10,216 gardens, and the remainder consisting of the course of rivers and roads, the site of towns and villages, and utterly uncultivated land, which latter constitutes nearly one fourth of the whole department. The subsoil is generally calcareous, often covered with a heavy clay difficult to plough, but in some parts mixed with sand or stone; and its power of production varies from moderate fertility to absolute barrenness. It produces some good wheat and rye, but the corn does not equal the consumption, though the culture of potatoes has been much extended of late years. The chief river, the Moselle, which begins to be navigable at Metz, and falls into the Rhine at Coblentz, receives the waters of the smaller streams. It is a rapid river, often causing great damage by the overflowing of its banks. Besides the common grain, much flax and some hemp are grown. The vine is much cultivated, but the wine is not of a good flavour, as most of that known by the name of Moselle wine throughout Europe grows on the banks of that river after it has quitted the French territory. The hills around Metz have their sides covered with vines, but the grapes are more used for the purposes of making vinegar and brandy than wine. There are

Moses. some mines of iron worked, and the material is converted into heavy articles for the use of ships, and for casting cannon. Some linen and woollen cloths are made, and there are fabrics of paper, glass, and earthenware. The population amounted in 1836 to 427,250 persons, who are mostly of the Catholic religion, though there are some few Calvinists, Anabaptists, and Jews. The French language is commonly spoken only in the cities. In the villages a patois called Lorraine is most prevalent; but in the eastern part a corrupted German prevails, and the inhabitants have the marks of that nation in their dress, countenances, and manners. The department sends four deputies to the legislative body. It is divided into four arrondissements, 27 cantons, and 604 communes.

MOSES, the son of Amram and Jochebed, was born in the year 1571 before Christ. Pharaoh king of Egypt, perceiving that the Hebrews had become a formidable nation, issued an edict commanding all the male children to be put to death. To avoid this cruel decree, Jochebed, the mother of Moses, having concealed her son for three months, at length made an ark or basket of bulrushes, daubed it with pitch, laid the child in it, and exposed him on the banks of the Nile. Thermuthis, the king's daughter, who happened to be walking by the river's side, perceived the floating cradle, commanded it to be brought to her, and, being struck with the beauty of the child, determined to preserve his life. In three years afterwards the princess adopted him as her own son, called his name Moses, and caused him to be diligently instructed in all the learning of the Egyptians. But his father and mother, to whom he was restored by a fortunate accident, were at still greater pains to teach him the history and religion of his fathers. Many things have been related by historians concerning the first period of Moses's life, which are not to be found in the Old Testament. According to Josephus and Eusebius, he made war upon the Ethiopians, and completely defeated them; and they add, that the city Saba, in which the enemy had been forced to take refuge, was betrayed into his hands by the king's daughter, who became deeply enamoured of him, when she beheld from the top of the walls his valorous exploits at the head of the Egyptian army. But as the truth of this expedition is more than doubtful, we shall confine ourselves to the narrative of Sacred Writ, which commences at the fortieth year of Moses's life. He then left the court of Pharaoh, and went to visit his countrymen the Hebrews, who groaned under the tyranny and oppression of their unfeeling masters. Having perceived an Egyptian smiting a Hebrew, he killed the Egyptian, and buried him in the sand. But he was obliged, in consequence of this murder, to fly into the land of Midian, where he married Zipporah, daughter of the priest Jethro, by whom he had two sons, Gershom and Eliezar. Here he lived forty years, during which time he employed himself in tending the flocks of his father-in-law. Having one day led his flock towards Mount Horeb, God appeared to him in the midst of a bush which burned with fire but was not consumed, and commanded him to go and deliver his brethren from their bondage. Moses at first refused to go, but was at length prevailed on by two miracles, which the Almighty wrought for his conviction. Upon his return to Egypt, he, together with his brother Aaron, went to the court of Pharaoh, and told him that God commanded him to let the Hebrews go to offer sacrifices in the desert of Arabia. But the impious monarch disregarded this command, and caused the labour of the Israelites to be doubled. The messengers of the Almighty again returned to the king, and wrought a miracle in his sight, that they might move his heart, and induce him to let the people depart. Aaron having cast down his miraculous rod, it was immediately converted into a serpent; but the same thing being performed by the magicians, the king's heart was more and more hardened, and his obstinacy at last drew down the judgments of the Almighty upon his kingdom, which was afflicted with ten dreadful plagues. The first was the changing of the waters of the Nile and of all the rivers into blood, so that the Egyptians died of thirst. In consequence of the second plague, the land was covered with innumerable swarms of frogs, which entered even into Pharaoh's palace. By the third plague the dust was converted into lice, which cruelly tormented both man and beast. The fourth plague consisted of a multitude of destructive flies which spread throughout Egypt, and infested the whole country. The fifth was a sudden pestilence, which destroyed all the cattle of the Egyptians, without injuring those of the Israelites. The sixth produced numberless ulcers and fiery boils both upon man and upon beast. The seventh was a dreadful storm of hail, accompanied with thunder and lightning, which destroyed every thing that was in the field, whether man or beast, and spared only the land of Goshen, where the children of Israel dwelt. By the eighth plague swarms of locusts were brought into the country, which devoured every green herb, the fruit of the trees, and the produce of the harvest. By the ninth plague thick darkness covered all the land of Egypt, excepting the dwellings of the children of Israel. The tenth and last plague was the death of the first-born in Egypt, who were all in one night cut off by the destroying angel, from the first-born of the king to the first-born of the slaves and of the cattle. This dreadful calamity moved the heart of the hardened Pharaoh, and he at length consented to allow the people of Israel to depart from his kingdom. Moses.

Profane authors who have spoken of Moses appear to have been in part acquainted with these mighty wonders. That he performed miracles, has been allowed by many, by whom he was considered as a famous magician; and he could scarcely appear in any other light to men who did not acknowledge him as the messenger of the Almighty. Both Diodorus and Herodotus mention the distressed state to which Egypt was reduced by these terrible calamities. The Hebrews, amounting to the number of six hundred thousand men, without reckoning women and children, left Egypt on the fifteenth day of the month Nisan, which, in memory of this deliverance, was thenceforth reckoned the first month of their year. Scarcely had they reached the shore of the Red Sea, when Pharaoh with a powerful army set out in pursuit of them. On this occasion Moses stretched forth his rod upon the sea; and the waters thereof being divided, remained suspended on both sides till the Hebrews passed through dry footed. The Egyptians determined to follow the same course; but God caused a violent wind to blow, which brought back the waters to their bed, and the whole army of Pharaoh perished in the waves.

After the miraculous passage of the Red Sea, the army proceeded towards Mount Sinai, and arrived at Marah, where the waters were bitter; but Moses, by casting a tree into them, rendered them fit for drinking. Their tenth encampment was at Rephidim, where Moses drew water from the rock in Horeb, by smiting it with his rod. Here likewise Amalek attacked Israel. Whilst Joshua fought against the Amalekites, Moses stood upon the top of a hill, and lifted up his hands, in consequence of which the Israelites prevailed, and cut their enemies in pieces. They at length arrived at the foot of Mount Sinai on the third day of the ninth month after their departure from Egypt. Moses having ascended several times into the mount, received the law from the hand of God himself in the midst of thunders and lightnings, and concluded the famous covenant between the Lord and the children of Israel. When he descended from Sinai, he found that the people had fallen into the idolatrous worship of the golden calf. The messenger of God, shocked at such ingratitude, broke in

Moses.

pieces the tables of the law which he carried in his hands, and put twenty-three thousand of the transgressors to the sword. He afterwards re-ascended the mountain, and there obtained new tables of stone, upon which the law was inscribed. But when he descended, his face shone so that the Israelites dared not to come nigh unto him, and he was obliged to cover it with a veil. The Israelites were here employed in constructing the tabernacle, according to a pattern shown them by God. It was erected and consecrated at the foot of Mount Sinai, on the first day of the first month of the second year after their departure from Egypt; and it served the Israelites instead of a temple till the time of Solomon, who built a house for the God of his fathers, after a model shown him by David.

Moses having dedicated the tabernacle, consecrated Aaron and his sons to be its ministers, and appointed the Levites to its service. He likewise gave various commandments concerning the worship of God and the political government of the Jews. This was a theocracy in the fullest extent of the word. God himself governed them immediately by means of his servant Moses, whom he had chosen to be the interpreter of his will to the people; and he required all the honours belonging to their king to be paid to himself. He dwelt in his tabernacle, which was situated in the middle of the camp, like a monarch in his palace; he gave answers to those who consulted him, and himself denounced punishment against the transgressors of his laws. This was properly the time of the theocracy, taken in its full extent; for God was not only considered as the divinity who formed the object of their religious worship, but as the sovereign to whom the honours of supreme majesty were paid. The case was nearly the same under Joshua, who, being filled with the spirit of Moses, undertook nothing without consulting God. Every measure, both of the leader and of the people, was regulated by the direction of the Almighty, who rewarded their fidelity and obedience by a series of miracles, victories, and successes. After Moses had regulated every thing regarding the civil administration and the marching of the troops, he led the Israelites to the confines of Canaan, to the foot of Mount Nebo; and here the Lord commanded him to ascend into the mountain, whence he showed him the promised land, into which he was not permitted to enter. He immediately afterwards yielded up the ghost, without sickness or pain, in the one hundred and twentieth year of his age, and 1451 years before Jesus Christ.

Moses is incontestably the author of the first five books of the Old Testament, which go by the name of the *Pentateuch*, and which are acknowledged to be inspired, by the Jews, and by Christians of every persuasion. Some, however, have denied that Moses was the author of these books, and have founded their opinion on this, that he always speaks of himself in the third person. But this manner of writing is by no means peculiar to Moses; it occurs also in several ancient historians, such as Xenophon, Cæsar, Josephus, and others, who, possessed of more modesty or good sense than some modern historians, whose egotism is altogether disgusting, have not, like them, left to posterity a spectacle of ridiculous vanity and self-conceit. After all, it is proper to observe, that profane authors have related many falsehoods and absurdities concerning Moses, and also concerning the origin and the religion of the Jews, with which they were in fact but little acquainted. Plutarch, in his book concerning Isis and Osiris, says, that Judæus and Hierosolymus were brothers, and descended from Typhon; and that the former gave his name to the country and its inhabitants, and the latter to the capital city. Others allege that they came from Mount Ida in Phrygia. Strabo is the only author who speaks anything like reason and truth concerning them; although he too says that they were descended from the Egyptians, and considers Moses their legislator to have been an Egyptian priest. He acknowledges, however, that they were a people strictly just and sincerely religious. Other authors by whom they are mentioned appear not to have had the smallest acquaintance either with their laws or with their worship; and frequently confound them with the Christians, as is the case with Juvenal, Tacitus, and Quintilian.

Moshaisk ‖ Mosque.

MOSHAISK, a circle of the province of Moscow, in Russia, extending over 630 square miles, and comprehending one city, one market-town, and 264 villages, with 56,530 inhabitants. The capital is the city of the same name, situated on the Moshaiska. It is fortified, and has a strong citadel. It was burned down on the retreat of the French in 1812, but has been since rebuilt and improved. It contains seven churches, a monastery, 670 houses, and 4240 inhabitants. Long. 27. 50. E. Lat. 55. 40. N.

MOSHEIM, John Laurence, an illustrious German divine, was born in 1695. He was descended of a noble family, which might seem to open to his ambition a fair path to civil promotion; but his zeal for the interests of religion, his thirst of knowledge, and particularly his taste for sacred literature, induced him to consecrate his talents to the service of the church. The German universities loaded him with literary honours; the king of Denmark induced him to settle at Copenhagen; and the Duke of Brunswick called him thence to Helmstadt, where he filled the academical chair of divinity, was honoured with the character of ecclesiastical counsellor to the court, and presided over the seminaries of learning in the duchy of Wolfenbuttel and in the principality of Blackenburg. When a design was formed of giving an uncommon degree of lustre to the university of Göttingen, by filling it with men of the first rank in letters, Dr Mosheim was deemed worthy to appear at the head of it, in quality of chancellor; and here he died, in the year 1755, universally lamented. In depth of judgment, in extent of learning, in purity of taste, in power of eloquence, and in laborious application to all the various branches of erudition and philosophy, he had certainly few superiors. His Latin translation of Cudworth's Intellectual System, enriched with large annotations, discovered a profound acquaintance with ancient learning and philosophy. His illustrations of the Scriptures, his labours in defence of Christianity, and the light he threw upon religion and philosophy, appear in many volumes of sacred and profane literature; whilst his Ecclesiastical History, from the birth of Christ to the beginning of the eighteenth century, is unquestionably the best that has yet appeared. This work, written in Latin, has been translated into English, and accompanied with notes and chronological tables by Dr Archibald Maclaine; and from the translator's preface to the second edition, 1758, in five vols. 8vo, this short account is taken.

MOSQUE, a temple or place of religious worship amongst the Mahommedans. All mosques are square buildings, generally constructed of stone. Before the chief gate there is a square court paved with white marble, and low galleries round it, the roof of which is supported by marble pillars. In these galleries the Turks wash themselves before they go into the mosque. In each mosque there is a great number of lamps; and between these are suspended many crystal rings, ostrich eggs, and other curiosities, which, when the lamps are lighted, make a fine show. As it is not lawful to enter the mosque with stockings or shoes on, the pavements are covered with pieces of stuff sewed together, each being wide enough to hold a row of men kneeling, sitting, or prostrate. The women are not allowed to enter the mosque, but remain in the porches without. About every mosque there are six high towers, called *minarets*, each of which has three little open galleries, one above another; these towers, as well as the mosques, are covered with lead, and adorned with gilding and other or-

Moss. naments; and from them the people are summoned to prayers by certain officers appointed for the purpose, called muezzins. Most of the mosques have a kind of hospital belonging to them, in which travellers, of whatsoever religion they may be, are entertained three days. Each mosque has also a place called *tarbe*, which is the burying-place of its founders; within it there is a tomb six or seven feet long, covered with green velvet or satin; at the ends are two tapers, and round it several seats for those who read the Koran and offer up prayers for the souls of the deceased.

MOSQUITO SHORE. See the articles GUATEMALA and HONDURAS.

MOSS, a name given to swampy ground, which is otherwise called a *fen* or *bog*.

In many of these grounds, as well in England and Ireland as in other parts of the world, there are found vast numbers of trees with their stumps erect, and their roots piercing the ground in a natural posture, as when growing. Many of these trees are broken or cut off near the roots, and lie along, for the most part in a north-east direction. Some persons, in attempting to account for this, have resolved it into the effect of the Deluge; but this is a very wild conjecture, and is proved to be groundless by many unanswerable arguments. The waters of this deluge might indeed have washed together a great number of trees, and buried them under loads of earth; but then they would have lain irregularly and at random, whereas they all lie lengthwise from south-west to north-east, and the roots all stand in their natural perpendicular posture, as close as the roots of trees in a forest.

Besides, these trees are not all in their natural state. Many of them bear evident marks of human workmanship, some being cut down with an axe, others split, and the wedges still remaining in them; some burned in different parts, and others bored through with holes. These things are also proved to be of a later date than the Deluge, by other matters found amongst them, such as utensils of ancient people, and coins of the Roman emperors.

It appears from the whole, that all the trees which we find in this fossil state grew originally in the very places where we now find them, and have been only thrown down and buried there, not brought from elsewhere. It may indeed appear an objection to this opinion, that most of these fossil trees are of the fir kind, and that Cæsar says expressly that no firs grew in Britain in his time; but this is easily answered, by observing, that these trees, though of the fir kind, are not of the species usually called the fir, but pitch-tree; and Cæsar has nowhere said that pitch-trees did not grow in England. Norway and Sweden abound with these trees; and there are still forests of them in many parts of Scotland, and a number of them upon a hill in Staffordshire to this day.

It is also objected by some to the system of the firs having grown where they are found fossil, that these countries are all bogs and moors, whereas such trees grow only in mountainous places. But this is founded on an error; for although in Norway and Sweden, and some other cold countries, the fir kinds all grow upon barren and dry rocky mountains, yet in warmer countries they are found to thrive as well upon wet plains. They are found plentifully in Pomerania, Livonia, and Courland; and in the western parts of New England there are vast numbers of fine stately trees of this kind in low grounds. The truth seems to be, that these trees love a sandy soil, such as is found at the bottoms of all the mosses where they are found fossil. The roots of the fir kind are almost always found fixed in these; and those of oaks, where they are discovered fossil in this manner, are usually found fixed in clay; so that each kind of tree is always found rooted in the places where they stand in their proper soil; and there is no doubt but that they originally grew there. Having thus found that all the fossil trees which we meet with once grew in the places where they are now buried, we may conclude that in these places there were once noble forests, which have, by some accident, been destroyed; and the only question that remains is, how and by whom this was effected. We have reason to believe, from the Roman coins found amongst them, that it was done by the people of that empire, at the time when they were established or establishing themselves here. Moss.

Their own historians tell us, that when their armies pursued the wild Britons, these people always sheltered themselves in the boggy woods and low watery forests. Cæsar expressly mentions this, observing, that Cassibelaunus and his Britons, after their defeat, passed the Thames, and fled into such low morasses and woods that there was no pursuing them; and we are informed that the Silures secured themselves in the same manner when attacked by Ostorius and Agricola. The same thing is recorded of Venutius king of the Brigantes, who, to secure himself, fled into the boggy forests of the midland part of this kingdom; and Herodian expressly states, that in the time when the Romans were pushing their conquests in these islands, it was the custom of the Britons to secure themselves in the thick forests which grew in boggy and wet places, and, when opportunity offered, to issue out thence and fall upon the invaders. The consequence of all this was the destruction of these forests. The Romans, finding themselves so plagued with parties of the natives issuing out upon them at all times from these forests, gave orders for cutting down and destroying all the forests in Britain which grew on boggy and wet grounds. These orders were punctually executed; and to this it is owing that at the present day we can hardly be brought to believe that such forests ever grew in our country as are now found buried in morasses.

The Roman historians all agree, that when Suetonius Paulinus conquered Anglesey, he ordered all the woods to be cut down there, in the same manner as the Roman generals had done in England; and Galen tells us, that the Romans, after their conquest in Britain, kept their soldiers constantly employed in cutting down forests, draining marshes, and paving bogs. And not only were the Roman soldiers employed in this manner, but all the native Britons made captives in the wars were obliged to assist in it; and Dion Cassius informs us, that the Emperor Severus lost no fewer than fifty thousand men in a short time in cutting down the woods and in draining the bogs of this island. It is not to be wondered at that such numbers executed the immense destruction of which we find evidence in these buried forests. One of the greatest subterranean treasures of wood is that near Hatfield; and it is easy to prove that the people to whom this havock has been attributed were upon the spot where these trees now lie buried. The common road of the Romans from the south to the north proceeded from *Lindum* or Lincoln to *Segelochum* or Little Burrow upon Trent, and thence to *Danum* or Doncaster, where they kept a standing garrison of Crispinian horse. A little off on the east and north-east of their road, between the two last-named towns, lay the borders of the great forest, which swarmed with wild Britons, who were continually sallying out, and retreating to it again; intercepting their provisions, taking and destroying their carriages, killing their allies and passengers, and disturbing their garrisons. This at length exasperated the Romans so much, that they determined to destroy it; and to do this safely and effectually, they marched against it with a great army, and encamped on a great moor not far from Finningly. This is evident from their fortifications yet remaining.

There is a small town in the neighbourhood called *Osterfield*; and as the termination *field* seems to have been given only in remembrance of battles fought near the towns whose names have this termination, it is not improbable

Mostra. that a battle was fought here between all the Britons who inhabited this forest and the Roman troops under Ostorius. The Romans slew many of the Britons, and drove the rest back into the forest, which at that time overspread all the low country. On this the conquerors, taking advantage of a strong south-west wind, set fire to the pitch-trees, of which the forest was principally composed; and when the greater part of the trees were thus destroyed, the Roman soldiers and captive Britons cut down the remainder, excepting a few large ones, which they left standing as memorials of the destruction of the rest. These single trees, however, could not stand long against the winds, but falling into the rivers which run through the country, interrupted their currents; and the water then overspreading the level country, formed one great lake, and gave origin to the mosses or moory bogs, which were afterwards formed there by the workings of the waters, the precipitation of earthy matter from them, the putrefaction of rotten boughs and branches of trees, and the vast increase of water-moss and other such plants which grow in prodigious abundance in all these sorts of places. Thus were these burned and felled trees buried under a newly-formed spongy and watery earth, and afterwards found on draining and digging through this deposit.

Hence it need not appear strange that Roman weapons and Roman coins are found amongst these buried trees; and hence also it is that amongst the buried trees some are found burned, some chopped and hewn; that the bodies of the trees all lie by their proper roots, and with their tops lying north-east, that is, in the direction in which a south-west wind would have blown them down; and that some of the trees are found with their roots lying flat, these being not cut nor burned down, but blown up by the roots afterwards when left single. It is not wonderful, that such trees as these should have continued to grow even after their fall, and to shoot up branches from their sides which might easily grow into high trees.

By this system it is also easily explained why the moor-land soil in the country is in some places two or three yards thicker than in others, or higher than it formerly was, since the growing up of peat-earth or bog-ground is well known, and the soil added by the overflowing of waters is by no means inconsiderable.

As the Romans destroyed this great and noble forest, so they probably also destroyed several other ancient forests, the ruins of which furnish the bog-wood of Staffordshire, Lancashire, Yorkshire, and other counties. But as the Romans were not much in Wales, in the Isle of Man, or in Ireland, it is not to be supposed that forests cut down by these people gave origin to the fossil wood found there; but although they did not cut down these forests, others did, and the origin of the bog-wood is the same with them as it is with us. Holingshed informs us, that Edward I. being unable to get at the Welsh because of their hiding in boggy woods, gave orders that these should all be destroyed by fire and by the axe; and doubtless the roots and bodies of trees found in Pembrokeshire under ground are the remains of the execution of this order. The fossil wood in the bogs of the Isle of Man is doubtless of the same origin, although we have not any account extant of the time nor the occasion of the forests there being destroyed; but as to the fossil trees of the bogs of Ireland, we are expressly told that Henry II. when he conquered that country, ordered all the woods to be cut down that grew in the low parts of it, in order to secure his conquests, by cutting away the places of resort for rebels.

MOSTRA, in the Italian music, a mark at the end of a line or space, to show that the first note of the next line is in that place. If this note be accompanied with a sharp or flat, it is proper to place these characters along with the mostra.

Mosul ‖ Motion.

MOSUL, a large city of Asiatic Turkey, which, although lying almost in the very heart of the pachalik of Bagdad, forms of itself, with a small territory, not extending more than two miles on each side of the town, an independent government, under the order of a pasha of two tails. It is situated on the western bank of the Tigris, on ground so low that the river, which is nearly 100 yards wide, and flows with great rapidity, often rises to the level of the houses. The houses are built partly of brick and partly of stone; and the roofs and even the ceilings of the apartments are vaulted, owing to the scarcity and dearness of timber. It is surrounded by a wall, which has seven gates, and which is broken down in many places. The castle, which is in a decayed condition, occupies a small artificial island in the Tigris. The coffee-houses, baths, khans, and bazaars, are handsome buildings; and the latter are well supplied with provisions from Kurdistan. The black palace being now in ruins, the pasha resides in a cluster of insignificant buildings, in the dirtiest quarter of the town. The principal ornaments of Mosul are a college, the tomb of Sheikh Abdul Cassim, and the remains of a beautiful mosque, the minaret of which, seen from a distance, has a fine effect. Like all the other towns of the Turkish empire, it is in a declining state, and the greater part of the best buildings are crumbling into ruins. On the west the country is in an uncultivated state, which, along with the extensive burying ground under the walls, gives the city a gloomy aspect. A trifling commerce is carried on with Bagdad and Asia Minor, to which gall-nuts are exported, and copper from Armenia, which is floated down the Tigris on rafts; and in return Indian commodities are received, which are forwarded to Diarbekr, Orfa, Tocat, and other places. The population amounts to 35,000, consisting of Turks, Kurds, Jews, Armenians, Nestorians, and Arabs. Lat. 36. 21. N.

MOTAPA (sometimes called MONOMOTAPA, but improperly, as *Mono* is here a general name for kingdom), is dignified in the early narratives with the title of empire. Accounts disagree so much regarding the limits which ought to be assigned to Motapa, that it is impossible to derive from them a consistent result. It is uncertain whether it ever deserved the name of empire; at all events, at the present day, it appears to be but a geographical division, comprising several kingdoms independent of each other, and regarding which little or nothing is known.

Incapable of being defined.

MOTION is now generally considered as incapable of definition, being merely a simple idea or notion received by the senses. The ancients, however, thought differently. Some of them defined it to be a passage out of one state into another, which conveys no idea to him who is ignorant of the nature of motion. The Peripatetic definition has been mentioned elsewhere, and shown to be wholly unintelligible, as well as the celebrated division, by the same sect, of motion into four classes belonging to the three categories, *quality*, *quantity*, and *where* (see METAPHYSICS). The Cartesians, too, amongst the moderns, pretend to define motion by calling it a passage or removal of one part of matter, out of the neighbourhood of those parts to which it is immediately contiguous, into the neighbourhood of others. Borelli defines motion to be the successive passage of a body from place to place. Others say that it is the application of a body to different parts of infinite and immoveable space; and Mr Young, in his Essay on the Powers of Nature, has given as a definition of motion, change of place.

We have elsewhere offered our opinion of every possible attempt to define motion; but as the author of the last-quoted definition has endeavoured to obviate such objections as ours, candour requires that he be heard for himself. "It is said," he observes, "by some, that change implies motion, and therefore cannot be a part of its definition, being the very thing defined. To this I answer, We are speaking of the sensible idea of motion, as it appears

Motion. to our sight; now changes do appear to our view, and to all our senses, which give us no idea of motion. Changes in heat or cold; in colour, flavour, smell, sound, hardness, softness, pain, pleasure; in these, and many other ideas, changes do not produce ideas like that produced by a ball rolling or a stone falling. We may perhaps ultimately trace them to motion, but to insensible motions; to motions which arise only in reflection, and constitute no part of the actual idea of change. We can therefore conceive of change without conceiving at the same time of motion. Change is a generic idea, including many species; motion, as a sensible idea, is a species of that genus. Change is therefore a necessary part of the definition of motion; it marks the genus of the thing defined. Motion is a change; but as there are many species of change, which of those species is motion? The answer is, it is a change of place. This marks the species, and distinguishes it from change of colour, of temperament, and figure."

This is the ablest defence of an attempt to define motion that we have ever seen; and at first view the definition itself appears to be perfect. Aristotle, the prince of definers, considers a definition[1] as "a speech declaring what a thing is." Every thing essential to the thing defined, and nothing more, must be contained in the definition. Now the essence of a thing consists of these two parts: first, what is common to it with other things of the same kind; and secondly, what distinguishes it from other things of the same kind. The first is called the *genus* of the thing; the second, its *specific difference*. The definition, therefore, consists of these two parts.

In obedience to this rule, the definition under consideration seems to consist of the genus, signified by the word *change*, and of the specific difference, denoted by the words *of place*. But does the speech *change of place* really declare what motion is? We cannot admit that it does? as, in our apprehension, a change of place is the effect of motion, and not motion itself. Suppose a lover of dialectic undertaking to define the stroke by which he saw his neighbour wounded with a bludgeon; what should we think of his art were he to call it a contusion on the head? He might say that contusion is a general term, as contusions may be produced on the arms, on the legs, and on various parts of the body; and as there are many species of contusion, if he were asked which of those species was the stroke to be defined, he might answer, "a contusion on the head." Here would be apparently the genus and specific difference; the former denoted by *contusion*, and the latter by the words *on the head*. But would this be a definition of a stroke? No, surely. A contusion on the head may be the effect of a stroke, but it can no more be the stroke itself, than a blow can be a bludgeon, or a flesh wound the point of a sword. Equally evident it is, that a change of place cannot be motion; because every body must have been actually moved before we can discern, or even conceive, a change of its place.

The act of changing the place would perhaps come nearer to a definition of motion; but so far would it be from "a speech declaring what motion is," that we are confident a man who had never by any of his senses perceived a body in actual motion, would acquire no ideas whatever from the words "act of changing place." He might have experienced changes in heat, cold, smell, and sound; but he could not possibly combine the ideas of such changes with the signification of the word *place*, were he even capable of understanding that word, which to us appears to be more than doubtful. See METAPHYSICS.

The distinctions of motion. The distinctions of motion into different kinds have been no less various, and no less insignificant, than the several definitions of it. The moderns who reject the Peripatetic division of motion into four classes, yet consider it themselves as either absolute or relative. Thus we are told, that absolute motion is the change of absolute place, and that its celerity must be measured by the quantity of absolute space which the moving body passes through in a given time. Relative motion, on the other hand, is a mutation of the relative or vulgar place of the moving body, and has its celerity estimated by the quantity of relative space passed through. Motion.

Now it is obvious, that this distinction conveys no ideas without a further explanation of the terms by which it is expressed; but that explanation is impossible to be given. Thus, before we can understand what absolute motion is, we must understand what is meant by absolute place. But absolute place is a contradiction; for all place is relative, and consists in the positions of different bodies with regard to one another. Were a globe in the regions of empty space to be put in motion by Almighty Power, and all the rest of the corporeal world to be soon afterwards annihilated, the motion would undoubtedly continue unchanged; and yet, according to this distinction, it would be at first relative, and afterwards absolute. That the beginning of such a motion would be perceptible, and the remainder of it imperceptible, is readily granted; but on this account to consider it as of two kinds, is as absurd as to suppose the motion of the minute hand of a clock to be affected by our looking at it.

Opinions of the Cartesians and Newtonians. Leaving these unintelligible distinctions, therefore, we now come to consider a question of a very abstruse nature, but much agitated amongst philosophers, namely, What is the original source of motion in the creation? Is it natural to matter, or are we to ascribe it to the immediate and continual agency of some immaterial being? The former has been strenuously argued by the Cartesians, and the latter by the Newtonians. The arguments of the former, founded upon the chimerical hypothesis of vortices and the original construction of matter, were evidently inconclusive; and the hypothesis of Sir Isaac Newton, who asserted that it was naturally incapable of motion, appeared more probable. To account for the quantity of motion in the universe, therefore, it became necessary to have recourse either to the Deity, or to some subordinate spiritual agent; and this became the more necessary, as the doctrine of an absolute vacuum in the celestial spaces, that is, throughout the incomparably greatest part of the creation, was one of the fundamental maxims of the system. As it was absolutely denied that matter existed in these spaces, and as it was plain that the celestial bodies affected one another at immense distances, the powers of attraction and repulsion were naturally called in as the sources of motion by their impulse upon inert and sluggish matter. And these being admitted, a speculation ensued concerning their nature. Spiritual, it was confessed, they were; but whether they were to be accounted the immediate action of the Divine Spirit himself, or that of some subordinate and inferior spirit, was a matter of no little dispute. Sir Isaac Newton, towards the latter part of his life, began to relax somewhat of the rigidity of his former doctrine, and allowed that a very subtile medium, which he called *ether*, might be the cause of attraction and repulsion, and thus of all the phenomena of nature. Since his time the multitude of discoveries in electricity, the similarity of that fluid to fire and light, with the vast influence it exerts on every part of the creation with which we are acquainted, have rendered it extremely probable that the ether mentioned by Sir Isaac is no other than the element of fire, "the most subtile[2] and elastic of all bodies, which seems to pervade and expand itself throughout the whole uni-

[1] See Dr Reid's account of Aristotle's logic, in Lord Kames' Sketches of Man.

[2] *Siris*, No. 153, &c.

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verse. Electrical experiments show that this mighty agent is everywhere present, ready to break forth into action, if not restrained and governed with the greatest wisdom. Being always restless and in motion, it actuates and enlivens the whole visible mass; is equally fitted to produce and to destroy; distinguishes the various stages of nature, and keeps up the perpetual round of generations and corruptions, pregnant with forms which it constantly sends forth and re-absorbs. So quick in its motions, so subtile and penetrating in its nature, so extensive in its effects, it seemeth no other than the vegetative soul or vital spirit of the world.

Opinions of the ancients on this subject.

"The animal spirit in man is the instrument both of sense and motion. To suppose sense in the corporeal world would be gross and unwarranted; but locomotive faculties are evident in all its parts. The Pythagoreans, Platonists, and Stoics, held the world to be an animal; though some of them have chosen to consider it as a vegetable. However, the phenomena do plainly show, that there is a spirit that moves, and a mind or providence that presides. This providence, Plutarch saith, was thought to be in regard to the world what the soul is in regard to man. The order and course of things, and the experiments we daily make, show that there is a mind which governs and actuates this mundane system as the proper and real agent and cause; and that the inferior instrumental cause is pure ether, fire, or the substance of light, which is applied and determined by an infinite mind in the macrocosm or universe, with unlimited power, and according to stated rules, as it is in the microcosm with limited power and skill by the human mind. We have no proof, either from experiment or reason, of any other agent or efficient cause than the mind or spirit. When, therefore, we speak of corporeal agents or corporeal causes, this is to be understood in a different, subordinate, and improper sense; and such an agent we know light or elementary fire to be."

Immediate cause of the planetary motions.

That this elementary fire, absorbed and fixed in all bodies, may be the cause of the universal principle of gravity, is made sufficiently evident by numberless experiments. Homberg having calcined in the focus of a burning glass some regulus of antimony, found that it had gained one tenth in weight, though the regulus, during the whole time of the operation, sent up a thick smoke, and thereby lost a considerable part of its own substance. It is vain to allege that any heterogeneous matter floating in the air, or that the air itself, may have been hurried into the mass by the action of the fire, and that by this additional matter the weight was increased; for it is known experimentally, that if a quantity of metal be even hermetically secured within a vessel of glass to keep off the air and all foreign matter, and the vessel be placed for some time in a strong fire, it will exhibit the same effect. "I have seen the operation performed," says Mr Jones,[1] "on two ounces of pewter filings, hermetically sealed up in a Florence flask, which in two hours gained fifty-five grains, that is, nearly a seventeenth. Had it remained longer in the fire, it might probably have gained something more; as, in one of Mr Boyle's experiments, steel filings were found to have gained a fourth.

"Of accounting for these effects there are but two possible ways. 1. If the quantity of matter be the same, or, in the case of calcination, be somewhat less, after being exposed to the action of the fire, while the gravity of the whole is become greater; then does it follow that gravity is not according to the quantity of matter, and of course is not one of its properties. 2. If there be an increase of the mass, it can be imputed to nothing but the matter of light or fire entangled in its passage through the substance, and so fixed in its pores, or combined with its solid parts, as to gravitate together with it. Yet it is certain, from the phenomenon of light darting from the sun, that this elementary fire does not gravitate till it is fixed in metal, or some other solid substance. Here then we have a fluid which gravitates, if it gravitate at all, in some cases and not in others; so that which way soever the experiment be interpreted, we are forced to conclude that elementary or solar fire may be the cause of the law of gravitation."

Motion.

That it is likewise in many cases the cause of repulsion, is known to every one who has seen it fuse metals, and convert water and mercury into elastic vapour. But there is a fact recorded by Mr Jones, which seems to evince that the same fluid, which, as it issues from the sun, exhibits itself in the form of light and heat, is in other circumstances converted into a very fine air, or cold ether, which rushes very forcibly towards the body of that luminary. "As a sequel to what has been observed," says he, "concerning the impregnation of solid substances with the particles of fire, give me leave to subjoin an experiment of M. de Stair. He tells us, that upon heating red lead in a glass whence the air was exhausted, by the rays of the sun collected in a burning glass, the vessel in which the said red lead was contained burst in pieces with a great noise. Now, as all explosions in general must be ascribed either to an admission of the air into a rarefied space, or to what is called the *generation* of it, and as air was not admitted upon this occasion, it must have been generated from the calx within the vessel; and certainly was so, because Dr Hales has made it appear that this substance, like crude tartar, and many others, will yield a considerable quantity of *air* in distillation. What went into the metal therefore as *fire*, came out of it again as *air;* which in a manner forces upon us conclusions of inestimable value in natural philosophy, and such as may carry us very far into the most sublime part of it."

One of the conclusions which the ingenious author thinks thus forced upon us is, that the motions of the planets round the sun, as well as round their own axes, are to be attributed to the continual agency of this fluid, under its two forms of elementary fire and pure air. As fire and light, we know that it rushes with inconceivable rapidity from the body of the sun, and penetrates every corporeal substance, exerting itself sometimes with such force as nothing with which we are acquainted is able to resist. If it be indeed a fact, that this elementary fire, or principle of light and heat, afterwards cools, and becomes pure air, there cannot be a doubt but that under such a form it will return with great force, though surely in a somewhat different direction, towards the sun, forming a vortex, in which the planets are included, and by which they must of course be carried round the centre. Mr Jones does not suppose that the air into which the principle of light and heat is converted, is of so gross a nature as our atmosphere. He rather considers it as cool ether, just as he represents light to be ether heated; but he maintains that this ether, in its aërial form, though not fit for human respiration, is a better *pabulum* of fire than the air which we breathe.

This theory seems exceedingly plausible; and the author supports it by many experiments. He has not, indeed, convinced us that the solar light is converted or convertible into pure air; but he has, by just reasoning from undoubted facts, proved that the whole expanse of heaven, as far as comets wander, is filled not only with light, which is indeed obvious to the senses, but also with a fluid, which, whatever it may be called, supplies the place of the air in feeding the fire of these ignited bodies.

That the motion of the heavenly bodies should result from the perpetual agency of such a medium, appears to us

[1] Essay on the First Principles of Natural Philosophy.

Motion. a much more rational hypothesis than that which makes them act upon each other at immense distances through empty space. But the hypothesis is by no means so complete a solution of the phenomena as some of its fond admirers pretend to think it. This fluid, whether called ether, heat, light, or air, is still material; and the question returns upon him who imagines that it is sufficient to account for gravitation, repulsion, magnetism, cohesion, and the like, What moves the fluid itself, and makes the parts of which it is composed cohere together? However widely it may be extended, it is incapable of positive infinity, and therefore *may be* divided into parts separated from each other; so that it must be held together by a foreign force, as well as a ball of lead or a piece of wax. As matter is not essentially active, the motion of this ether, under both its forms, must likewise be considered as an effect, for which we do not think that any propelling power in the body of the sun can be admitted as a sufficient cause. For how comes the sun to possess that power, and what makes the fluid return to the sun? We have no notion of power in the proper sense of the word, but as intelligence and volition; and, like the pious and excellent author of the Essay on the First Principles of Natural Philosophy, we are certain that the sun was never supposed to be intelligent.

It is therefore by some supposed to be animated.

Bishop Berkeley, who admits of light or ether as the instrumental cause of all corporeal motion, gets rid of this difficulty by supposing, with the ancients, that this powerful agent is animated. "According to the Pythagoreans and Platonists," says his lordship,[1] "there is a life infused throughout all things; the πυρ νοερον, πυρ τεχνικον, an intellectual and artificial fire, an inward principle, animal spirit, or natural life, producing and forming within, as art doth without; regulating, moderating, and reconciling the various motions, qualities, and parts of the mundane system. By virtue of this life, the great masses are held together in their ordinary courses, as well as the minutest particles governed in their natural motions, according to the several laws of attraction, gravity, electricity, magnetism, and the rest. It is this gives instincts, teaches the spider her web, and the bee her honey. This it is that directs the roots of plants to draw forth juices from the earth, and the leaves and the cortical vessels to separate and attract such particles of air and elementary fire as suit their respective natures."

This life or animal spirit seems to be the same thing which Cudworth calls plastic nature, and which has been considered elsewhere. (See METAPHYSICS.) We shall therefore dismiss it at present, with just admitting the truth of the bishop's position, "that if nature be supposed the life of the world, animated by one soul, compacted into one frame, and directed or governed in all its parts by one supreme and distinct intelligence, this system cannot be accused of atheism, though perhaps it may of mistake or impropriety."

A new theory of motion.

A theory of motion somewhat similar to that of Berkeley, though in several respects different from it, was not very long ago stated with great clearness, and supported with much ingenuity, in an Essay on the Powers and Mechanism of Nature, intended to improve, and more firmly establish, the grand superstructure of the Newtonian system. Mr Young, the author of the essay, admits, with most other philosophers of the present age, that body is composed of atoms which are impenetrable to each other, and may be denominated solid. These atoms, however, he does not consider as primary and simple elements, incapable of resolution into principles; but thinks that they are formed by certain motions of the parts of a substance immaterial and essentially active.

Motion. As this notion is uncommon, and the offspring of a vigorous mind, we shall consider it more attentively hereafter. It is mentioned at present as a necessary introduction to the author's theory of motion, of which he attributes both the origin and the continuance to the agency of this elementary substance pervading the most solid atoms of the densest bodies. Of every body and every atom he holds the constituent principles to be essentially active; but those principles act in such a manner as to counterbalance each other, so that the atom or body considered as a whole is inert, unless in so far as it resists the compression or separation of its parts. No body or atom can of itself begin to move, or continue in motion for a single instant; but, being pervious to the active substance, and coalescing with it, that substance, when it enters any body, carries it along with it, till, meeting some other body in the way, either the whole of the active substance lodged in the former body passes into the obstacle, in which case the impelling body instantly ceases to move; or else part of that substance passes into the obstacle, and part remains in the impelling body; and in this case both bodies are moved with a velocity in proportion to the quantity of matter which each contains, combined with the quantity of active substance by which they are respectively penetrated.

In order to pave the way for his proof of the existence of one uniform active substance, he observes, that "change being an essentially constituent part of motion, and change implying action, it follows that all motion implies action, and depends on an active cause. Every motion," he continues, "has a beginning, a middle, and an end. The beginning is a change from rest to motion; the middle is a continuance in motion; the end is a change from motion to rest." He then proceeds to show, that the beginning of motion is by an action begun; the continuance of motion by an action continued; and the end of motion by a cessation of action.

"The first of these positions is admitted by every body. That the continuance of motion is by an action continued, will be proved, if it shall be shown that the continuance of a motion is nothing different from its beginning, in regard to any point of time assumed in the continued motion. Now the beginning of motion," he says, "consists in the beginning of change of place. But if any given portions of time and of space are assumed, a body beginning to move in the commencement of that time, and in the first portion of the space assumed, then and there begins that particular motion: And whether before the body began to move in that space it was moving in other spaces and times, has no relation to the motion in question; for this being in a space and time altogether distinct, is a distinct motion from any which might have preceded it immediately, as much as from a motion which preceded it a thousand years before. It is therefore a new motion begun; and so it may be said of every assumable point in the continued motion. The term *continued* serves only to connect any two distinct motions, the end of one with the beginning of the other, but does not destroy their distinctness."

He then proceeds to combat, which he does very successfully, the arguments by which the more rigid Newtonians endeavour to prove that a body in motion will continue to be moved by its own *inertia*, till stopped by some opposite force. Having done this, he establishes the contrary conclusion by the following syllogisms:

"I. Whatever requires an active force to stop its motion, is disposed to move;

But every body in motion requires an active force to stop its motion;

[1] *Siris*, No. 277.

Motion. Therefore every body in motion is disposed to move.

"II. Whatever is disposed to motion is possessed of action;

But a body in motion is disposed to continue in motion;

Therefore a body in motion is possessed of action.

Thus it appears that the middle part of any motion is action equally with the beginning.

"The last part of motion is its termination. It is admitted that all motion is terminated by an action contrary to the direction of the motion. It is admitted, too, that the moving body acts at the time its motion is destroyed. Thus the beginning and the end of any uniform motion are confessed to be actions; but all the intermediate continuation which connects the beginning with the end is denied to be action. What can be more unaccountable than this denial? Is it not more consonant to reason and analogy, to ascribe to the whole continued motion one uninterrupted action? Such a conclusion true philosophy, we think, requires us to make.

"To move or act, is an attribute which cannot be conceived to exist without a substance. The action of a body in motion is indeed the attribute of the body, and the body relatively to its own motion is truly a substance, having the attribute or quality of motion. But the body being a name signifying a combination of certain ideas, which ideas are found to arise from action, that action which is productive of those ideas the combination of which we denominate body, is of the nature of an attribute as long as it is considered as constituted of action. To this attribute we must necessarily assign its substance. The actions which constitute body must be actions of something, or there must be something which acts. Whence, then, is this active something, from whose agency we get the idea of body, or whose actions constitute body? Is it not sufficient that it is something active? A name might be surely given it, but a name would not render the idea more clear. Its description may be found in every sensation; it is colour to the eye, flavour to the palate, odour to the nose, sound to the ear, and feeling to the touch; for all our sensations are but so many ways in which this active something is manifested to us. A substratum of solidity philosophers have imagined to exist, and have in vain sought to find. Our active substance is the substratum so long sought for, and with so little success. We give it a quality by which it may be perceived; it acts. One modification of action produces matter, another generates motion. These modifications of action are modes of the active substance, whose presence is action. Matter and motion constitute the whole of nature. There is therefore throughout nature an active substance, the constituent essence of matter, and immediate natural agent in all effects."

By an argument which we do not think very conclusive, our author determines this active substance to be unintelligent. "In our sensations individually, not discovering," says he, "the traces, not seeing the characters of intelligence, but finding only action present and necessary, our inferences go no farther than our observations warrant us to do; and we conclude in all these things an action only, and that action unintelligent." Having given our opinion of real agency elsewhere (see METAPHYSICS), we shall not here stop to examine this reasoning. We may, however, ask, whether all our sensations individually be not excited for a certain end. If they be, according to our author's mode of arguing in another place, then the exciting agent should be an intelligent being. By this we are far from meaning to deny the reality of a secondary or instrumental cause of sensation which is destitute of intelligence. We are strongly inclined to think that there is such a cause, though our persuasion results not from this argument of our author's. In our opinion, he reasons better when he says, "that a subordinate agent constructed as the matter of creation, invested with perpetual laws, and producing agreeably to those laws all the forms of being, through the varieties of which inferior intelligences can, by progressive steps, arrive ultimately at the Supreme Contriver, is more agreeable to our ideas of dignity, and tends to impress us with more exalted sentiments, than viewing the Deity directly in all the individual impressions we receive, divided in the infinity of particular events, and unawful, by his continual presence in operations to our view insignificant and mean." Motion.

This active substance, or secondary cause, our author concludes to be neither matter nor mind. "Matter," says he, "is a being, as a whole quiescent and inactive, but constituted of active parts, which resist separation, or cohere, giving what is usually denominated solidity to the mass. Mind is a substance which thinks. A being which should answer to neither of these definitions, would be neither matter nor mind, but an immaterial, and, if I may so say, an immental substance." Such is the active substance of Mr Young, which, considered as the cause of motion, seems not to differ greatly from the *plastic nature*, *hylarchical principle*, or *vis genitrix*, of others. The manner in which it operates is indeed much more minutely detailed by our author than by any other philosopher, ancient or modern, with whose writings we have any acquaintance.

"Every thing," he says, "must be in its own nature either disposed to rest or motion; consequently the active substance must be considered as a being naturally either quiescent or motive. But it cannot be naturally quiescent, for then it could not be active, because activity, which is a tendency to motion, cannot originate in a tendency to rest. Therefore the active substance is by nature motive, that is, tending to motion. The active substance is not solid, and does not resist penetration. It is, therefore, incapable of impelling or of sustaining impulse. Whence it follows, that as it tends to move, and is incapable of having its motion impeded by impulse, it must actually and continually move; in other words, motion is essential to the active substance.

"In order that this substance may act, some other thing upon which it may produce a change is necessary; for whatever suffers an action, receives some change. The active substance, in acting on some other thing, must impart and unite itself thereto; for its action is communicating its activity. But it cannot communicate its activity without imparting its substance; because it is the substance alone which possesses activity, and the quality cannot be separated from the substance. Therefore the active substance acts by uniting itself with the substance on which it acts. The union of this substance with bodies is not to be conceived of as a junction of small parts intimately blended together and attached at their surfaces; but as an entire diffusion and incorporation of one substance with another in perfect coalescence. As bodies are not naturally active, whenever they become so, as they always do in motion, it must be by the accession of some part of the active substance. The active substance being imparted to a body, penetrates the most solid or resisting parts, and does not reside in the pores without, and at the surfaces of the solid parts. For the activity is imparted to the body itself, and not to its pores, which are no parts of the body; therefore, if the active substance remained within the pores, the cause would not be present with its effect, but the cause would be in one place and the effect in another, which is impossible.

"Bodies, by their impulse on others, lose their activity in proportion to the impulse. This is matter of observation. Bodies which suffer impulse acquire activity in proportion to the impulse. This also is matter of observation. In impulse, therefore, the active substance passes out of the impelling body into the body impelled. For since bo-

Motion. dies in motion are active, and activity consists in the presence of the active substance, and by impulse bodies lose their activity, therefore they lose their active substance, and the loss is proportional to the impulse. Bodies impelled acquire activity; therefore acquire active substance, and the acquisition is proportioned to the impulse. But the active substance lost by the impelling body ought to be concluded to be that found in the other; because there is no other receptacle than the impelled body to which the substance parted from can be traced, nor any other source than the active body whence that which is found can be derived. Therefore, in impulse, the active substance ought to be concluded to pass from the impelling body to the body impelled. The flowing of such a substance is a sufficient cause of the communication of activity, and no other rational cause can be assigned.

"The continued motion of a body depends not upon its inertia, but upon the continuance of the active substance within the body. The motion of a body is produced by the motion of the active substance in union with the body. It being evident, that since the active substance itself does always move, whatever it is united to will be moved along with it, if no obstacle prevent. In mere motion, the body moved is the patient, and the active substance the agent. In impulse, the body in motion may be considered as an agent, as it is made active by its active substance. While the active substance is flowing out of the active body into the obstacle or impelled body, the active body will press or impel the obstacle. For while the active substance is yet within the body, although flowing through it, it does not cease to impart to the body its own nature, nor can the body cease to be active because not yet deprived of the active substance. Therefore, during its passing out of the body, such portion of the active substance as is yet within, is urging and disposing the body to move, in like manner as if the active substance were continuing in the body; and the body being thus urged to move, but impeded from moving, presses or impels the obstacle.

"We see here," says our author, "an obvious explanation of impulse; it consists in the flowing of the motive substance from a source into a receptacle;" and he thinks, that although the existence of such a substance had not been established on any previous grounds, the communication of motion by impulse does alone afford a sufficient proof of its reality.

He employs the agency of the same substance to account for many other apparent activities in bodies, such as those of fire, electricity, attraction, repulsion, elasticity, &c. All the apparent origins of corporeal activity serve, he says, to impart the active substance to bodies; "and where activity is without any manifest origin, the active substance is derived from an invisible source."

Our limits will not permit us to attend him in his solution of all the apparent activities in bodies; but the orbicular motions of the planets have been accounted for in so many different ways by philosophers ancient and modern, and each account has been so little satisfactory to him who can think, and wishes to trace effects from adequate causes, that we consider it as our duty to furnish our readers with the account of this phenomenon which is given by Mr Young.

The question which has been so long agitated, "Whence is the origin of motion?" our author considers as implying an absurdity. "It supposes," says he, "that rest was the primitive state of matter, and that motion was produced by a subsequent act. But this supposition must ever be rejected, as it is giving precedency to the inferior, and inverting the order of nature." The substance which he holds to be the basis of matter is essentially active, and its action is motion. This motion, however, in the original element, was power without direction, agency without order, activity to no end. To this power it was necessary that a law should be superadded; that its agency should be guided to some regular purpose, and its motion conspire to the production of some uniform effects. Our author shows, or endeavours to show, by a process of reasoning which shall be examined elsewhere, that the primary atoms of matter are produced by the circular motion of the parts of this substance round a centre; and that a similar motion of a number of these atoms around another centre common to them all, produces what in common language is called a *solid body;* a cannon ball, for instance, the terrestrial globe, and the body of the sun, &c. In a word, he labours to prove, and with no small success, that a principle of union is implied in the revolving or circulating movements of the active substance. Motion.

"But we may also assume," he says, "*a priori*, that a principle of union is a general law of nature; because we see in fact all the component parts of the universe are united systems, which successively combine into larger unions, and ultimately form one whole." Let us then suppose the sun, with all his planets, primary and secondary, to be already formed for the purpose of making one system, and the orbits of all of them, as well as these great bodies themselves, to be pervaded by the active substance, which necessarily exists in a state of motion, and is the cause of the motion of every thing corporeal. "If to this motion a principle of union be added, the effect of such a principle would be a determination of all the parts of the active substance, and of course all the bodies to which it is united, towards a common centre, which would be at rest, and void of any tendency in any direction. But this determination of all the parts of the system towards a common centre tends to the destruction both of the motion of the active substance and of the system; for should all the parts continually approximate from a circumference towards a centre, the sun and planets would at last meet, and form one solid and quiescent mass. But to preserve existence, and consequently motion, is the first law of the active substance, as of all being; and it cannot be doubted, that to preserve distinct the several parts of the solar system, is the first law given to the substance actuating that system. The union of the system is a subsequent law.

"When the direct tendency of any inferior law is obviated by a higher law, the inferior law will operate indirectly in the manner the nearest to its direct tendency that the superior law will permit. If a body in motion be obliquely obstructed, it will move on in a direction oblique to its first motion. Now the law of union, which pervades the solar system, being continually obstructed by the law of self-preservation, the motion of the active substance, and of the bodies to which it is united, can be no other than a revolving motion about the common centre of approach, towards which all the parts have a determination. But when this revolution has actually taken place, it gives birth to a new tendency, which supersedes the operation of the law of self-preservation. It has been shown, that the motion essential to the active substance required to be governed by some law, to give being to an orderly state of things. Now, there are motions simple and motions complex; the more simple is in all things first in order, and out of the more simple the more complex arises in order posterior. The most simple motion is rectilineal; therefore a rectilineal motion is to be considered as that which is the original and natural state of things, and consequently that to which all things tend. It will follow from hence, that when any portion of active substance in which the law of union operates, has in the manner above explained been compelled to assume a revolving motion, that is, a motion in some curve, a tendency to a rectili-

Motion. neal motion will continually exist in every part of the revolving portion, and in every point of the curve which it describes during its revolution. And this rectilineal tendency will be a tendency to recede from the centre in every point of the revolving orbit, and to proceed in a tangent to the orbit at each point. These two tendencies, if not originally equal, must necessarily in all cases arrive at an equality. For the tendency towards the centre, called the *centripetal* tendency, that is, the law of union, operating first, if we suppose the motion approaches the centre, the tendency to recede from it, called the *centrifugal* tendency, will have its proportion to the centripetal continually increased as the orbit of revolution grows less, so as ultimately to equal the centripetal tendency, and restrain the motion from its central course, at which point it will no longer seek the centre, but revolve round it."

As our author holds that every atom of matter is formed by the motion of parts of the active substance, and every body formed by the motion of atoms; so he maintains, not only that the sun, moon, earth, planets, and stars, are penetrated by the same substance, but that each is the centre of a vortex of that substance, and that of these vortices some are included within others. "The subtile revolving fluid, the centre of whose vortex the earth occupies, not only surrounds, but pervades the earth, and other vortices their earths, to their centres; and the earth and planets are by its revolutions carried around on their own axes. The earth is an active mass, and all its component masses are severally as well as collectively inactive; but the earth and all its parts have various collective and separate movements, imparted from the fluid which surrounds, pervades, and constitutes it. Being immersed together with its proper surrounding sphere or vortex in the larger sphere or vortex of the sun, it is carried thereby in a larger orbit about the sun, at the same time that by the revolution of its proper sphere it rotates on its own axis."

Objections to this theory. Such is the most complete view which our limits will permit us to give of Mr Young's theory of motion. To the philosopher who considers experiment as the only test of truth, and who in all his inquiries employs his hands more than his head, we are fully aware that it will appear in no better light than as "the baseless fabric of a vision." Even to the intellectual philosopher who is not frightened at the word metaphysics, we are afraid that such an active substance as the author contends for, will appear as inadequate to the production of the phenomena of gravitation and repulsion as the material ether of Mr Jones and his followers. A being void of intelligence, whether it be material or immaterial, quiescent or motive, cannot be the subject of law, in the proper sense of the word. The laws of which Mr Young speaks as necessary to regulate the motions of the active substance, must be mere forces, applied by some extrinsic and superior power. And since motion, as it is essential to the active substance, is power without direction, agency without order, activity to no end; since it is of such a nature, that from its unguided agitations there could result neither connection, order, nor harmony; it follows that those extrinsic forces must be perpetually applied, because what is essential to any substance can never be destroyed or changed as long as the substance itself remains.

Forces producing order out of confusion can be applied only by a being possessed of intelligence; and if the immediate and perpetual agency of an intelligent being be necessary to regulate the motions of the active substance, that substance itself may be thought superfluous, and its very existence may be denied. *Entia non sunt multiplicanda absque necessitate*, is a rule of philosophizing which every man of science acknowledges to be just. And it will hardly be denied that the immediate and perpetual agency of an intelligent being upon Mr Jones's ethereal fluid, or even upon the matter of solid bodies themselves, would be capable of producing every kind of motion, without the instrumentality of a substance which is neither mind nor matter. Motion.

Other theories. Such, we conceive, are the objections which our metaphysical readers may make to this theory. Part of their force, however, will perhaps be removed by the ingenious manner in which our author analyzes matter into an immaterial principle. But so much of it remains that the writer of this article is inclined to believe that no mechanical account can be given of the motions of the heavenly bodies, the growth of plants, and various other phenomena which are usually solved by attraction and repulsion. In the present age, philosophers in general are strangely averse to admitting on any occasion the agency of mind; yet as every effect must have a cause, it is surely not irrational to attribute such effects as mechanism cannot produce to the operation either of intelligence or instinct. To suppose the Deity the immediate agent in the great motions of the universe, has been deemed impious; and it must be confessed that very impious conclusions have been deduced from that principle. But there is surely no impiety in supposing, with the excellent Bishop of Cloyne, that the fluid which is known to pervade the solar system, and to operate with resistless force, may be animated by a powerful mind, which acts instinctively for ends of which itself knows nothing. For the existence of such a mind, no other evidence, indeed, can be brought than what is afforded by a very ancient and very general tradition, and by the impossibility of accounting for the phenomena upon principles of mere mechanism. Perhaps some of our more pious readers may be inclined to think that the Supreme Being has committed the immediate government of the various planetary systems to powerful intelligences, or angels, who, as his ministers, direct their motions with wisdom and foresight. Such an opinion is certainly not absurd in itself; and it seems to be countenanced by an ancient writer, who, though not known by the name of a philosopher, knew as much of the matter as any founder of the most celebrated school.

To object to either of these hypotheses, as has sometimes been done, that it represents the government of the world as a perpetual miracle, betrays the grossest ignorance; for we might as well call the movements of the bodies of men and brutes, which are certainly produced by minds, miraculous. We do not affirm that either hypothesis is certainly true; but they are both as probable and as satisfactory as the hypothesis which attributes agency to attraction and repulsion, to a subtile ether, or to a substance which is neither mind nor matter. Were the immediate agency of intellect to be admitted, there would be no room for many of those disputes which have been agitated amongst philosophers, about the increase or diminution of motion in the universe; because an intelligent agent, which could begin motion as well as carry it on, might increase or diminish it as he should judge proper. If instinctive agency, or something similar to it, be adopted, there is the same room for investigation as upon the principles of mechanism; because instinct works blindly, according to steady laws imposed by a superior mind, which may be discovered by observation of their effects. As we consider this as by far the more probable hypothesis of the two, we find ourselves involved in the following question: If a certain quantity of motion was originally communicated to the matter of the universe, how comes it to pass that the original quantity still remains? Considering the many opposite and contradictory motions which since the creation have taken place in the universe, and which have undoubtedly destroyed a great part of the original quantity, by what means has that quantity been restored?

Motion. If this question can be resolved by natural means, it must be upon the principles of Newton; for, in every case where quantities and relations of quantities are required, it is the province of mathematics to supply the information sought; and all philosophers agree that Sir Isaac's doctrine of the composition and resolution of motion, though in what respects the heavenly bodies it may have no physical reality, is so mathematically just, as to be the only principle from which the quantity of motion, or the force of powers, can in any case be computed. If we choose to answer the question, by saying that the motion left is restored by the interposition of the Deity, then we might as well have had recourse to him at first, and say that he alone is the true principle of motion throughout the universe.

Before we are reduced to this dilemma, however, it is necessary, in the first place, to inquire whether there is or can be any real diminution of the quantity of motion throughout the universe? In this question the Cartesians take the negative side, and maintain that the Creator at the beginning impressed a certain quantity of motion on bodies, and that under such laws that no part of it could be lost, but the same portion of motion would be constantly preserved in matter; and hence they conclude, that if any moving body should strike on any other body, the former would lose no more of its motion than it communicated to the latter. Sir Isaac Newton takes the contrary side, and argues in the following manner: From the various compositions of two motions, it is manifest there is not always the same quantity of motion in the world; for if two balls, joined together by a slender wire, revolve with a uniform motion about their common centre of gravity, and at the same time that centre be carried uniformly in a right line drawn in the plane of their circular motion, the sum of the motions of the two balls, as often as they are in a right line, drawn from their common centre of gravity, will be greater than the sum of their motions when they are in a line perpendicular to that other. Hence it appears, that motion may be both generated and lost. But by reason of the tenacity of fluid bodies, and the friction of their parts, with the weakness of the elastic power in solid bodies, nature seems to incline much rather to the destruction than the production of motion; and, in reality, motion becomes continually less and less. For bodies which are either so perfectly hard or so soft as to have no elastic power, will not rebound from each other; and their impenetrability will only stop their motion. And if two such bodies equal to one another be carried with equal but opposite motions, so as to meet in a void space, by the laws of motion they must stop in the very place of concourse, lose all their motion, and be at rest for ever, unless they have an elastic power to give them a new motion. If they have elasticity enough to make them rebound with one fourth, one half, or three fourths, of the force they meet with, they will lose three fourths, one half, or one fourth, of their motion. And this is confirmed by experiments; for if two equal pendulums be let fall from equal heights, so as to strike full upon each other; if those pendulums be of lead or soft clay, they will lose all, or almost all, their motion; and if they be of any elastic matter, they will only retain so much motion as they receive from their elastic power.

Motion, therefore, being thus, in the opinion of this celebrated author, lost or absolutely destroyed, it is necessary to find some cause by which it may be renewed. Such renovation Sir Isaac attributes to active principles; for instance, the cause of gravity, whereby the planets and comets preserve their motions in their orbits, and all bodies acquire a great degree of motion in falling; and the cause of fermentation, whereby the heart and blood of animals preserve a perpetual warmth and motion, the inner parts of the earth are kept perpetually warmed, many bodies burn and shine, and the sun himself burns and shines, and with his light warms and cheers all things. Motion.

Elasticity is another cause of the renovation of motion mentioned by Sir Isaac. "We find but little motion in the world," says he, "except what plainly flows either from these active principles, or from the command of the willer."

No power of motion ever lost or destroyed. With regard to the destruction or positive loss of motion, however, we must observe, that, notwithstanding the high authority of Sir Isaac Newton, it is altogether impossible that any such thing can happen. All moving bodies which come under the cognizance of our senses are merely passive, and acted upon by something which we call *powers* or *fluids*, and which are to us totally invisible. Motion, therefore, cannot be lost without a destruction or diminution of one of these powers, which we have no reason to think can ever happen. When two pendulums rush against each other, the motion is the mere effect of the action of gravity; and that action, which in this case is the power, continues to be the very same whether the pendulum moves or not. Could motion, therefore, be exhausted in this case, we must suppose, that by separating two pendulums to the same distance from each other, and then letting them come together, for a great number of times, they would at last meet with less force than before. But there is certainly not the least foundation for this supposition; and no rational person will take it into his head, that supposing the whole human race had employed themselves in nothing else from the creation to the present day but in separating pendulums and letting them stop each other's motion, they would now come together with less force than they did at first. Power, therefore, which is the cause of motion, is absolutely indestructible. Powers may indeed counteract one another, or they may be made to counteract themselves; but the moment that the obstacle is removed, they show themselves in their pristine vigour, without the least symptom of abatement or decay.

Whether, therefore, we reckon the ultimate source of motion to be spiritual or material, it is plain that it must be to our conceptions infinite; neither will the phenomena of nature allow us to give any other explanation than we have done; for no power whatever can lose more than its own quantity, and it seems absurd to think that the Deity would create the world in such a manner that it should ultimately become immoveable, and then have recourse to unknown principles to remedy the supposed defect. On the principle we have just now laid down, however, the matter becomes exceedingly plain and obvious. The Creator at first formed two opposite powers, the action of which is varied according to the circumstances of the bodies upon which they act; and these circumstances are again varied by the action of the powers themselves in innumerable ways upon one another, and the approach of one body to another, or their receding to a greater distance. Where these powers happen to oppose each other directly, the body upon which they act is at rest; when they act obliquely, it moves in the diagonal; or if the force acting upon one side is by any means lessened, the body certainly must move towards that side, as is evident from the case of the atmosphere, the pressure of which, when removed from one side of a body, will make it move very violently towards that side, and if we could continually keep off the pressure in this manner, the motion would assuredly be *perpetual*. We must not imagine that motion is destroyed because it is counteracted; for it is impossible to destroy motion by any means but removing the cause; counteracting the effect is only a temporary obstacle, and must cease whenever the obstacle is removed. Nature, therefore, having in itself an infinite quantity of motion, produces greater or lesser motions, according to the various action of the moving powers upon different bo-

Motir ‖ Moufet.

dies or upon one another, without a possibility of the general stock being either augmented or diminished; unless one of the moving powers were withdrawn by the Creator, in which case the other would destroy the whole system in an instant. As to the nature of these great original powers, we must confess ourselves totally ignorant; nor do we perceive any data from which the nature of them can be investigated. The elements of light, air, &c. are the agents; but in what manner they act, or in what manner they received their action, can be known only to the Creator himself.

Perpetual Motion, in *Mechanics*, a motion which is supplied and renewed from itself, without the intervention of any external cause; or it is an uninterrupted communication of the same degree of motion from one part of matter to another, in a circle or other curve returning into itself, so that the same momentum still returns undiminished upon the first mover.

The celebrated problem of a perpetual motion consists in the inventing of a machine which shall have the principles of its motion within itself. M. de la Hire has demonstrated the impossibility of any such machine, and shown that it amounts to this, namely, to find a body which is both heavier and lighter at the same time, or to find a body which is heavier than itself.

MOTIR, an island in the Eastern Seas, of a triangular form, about twenty-four miles south from Ternate. Long. 127. 19. E. Lat. 0. 26. N.

MOTIVE is sometimes applied to that faculty of the human mind by which we voluntarily pursue good and avoid evil. Thus Hobbes distinguishes the faculties of the mind into two sorts, the cognitive and motive.

MOTOUALIS, a small nation of Syria, living to the east of the country of the Druses, in the valley which separates their mountains from those of Damascus.

MOTTO, in armoury, a short sentence or phrase carried in a scroll, generally under, but sometimes over, the arms, sometimes alluding to the bearing, sometimes to the name of the bearer, and sometimes containing whatever pleases the fancy of the deviser.

MOVEABLE, in general, denotes any thing capable of being moved. Moveable feasts are such as are not always held on the same day of the year or month, though they be on the same day of the week. Thus Easter is a moveable feast, being always held on the Sunday which falls upon or next after the first full moon following the 21st of March. All the other moveable feasts follow Easter, that is, they keep their distance from it, so that they are fixed with respect thereto. Such are Septuagesima, Sexagesima, Ash Wednesday, Ascension Day, Pentecost, Trinity Sunday, and the rest.

MOUFET, Thomas, a celebrated English physician, was born at London, and practised medicine with great reputation. Towards the close of his life he retired to the country, and died about the year 1600. This physician is known by a work which was begun by Edward Wotton, and printed at London in 1634, folio, under the title of *Theatrum Insectorum*. A translation of it into English was published at London in 1658, folio. Martin Lister gives a very unfavourable opinion of this book. "As Moufet," says he, "made use of Wotton, Gesner, and others, an excellent work might have been expected from him; and yet his *Theatrum* is full of confusion, and he has made a very bad use of the materials with which these authors have furnished him. He is ignorant of the subject of which he treats, and his manner of expression is altogether barbarous. Besides this, he is extremely arrogant, to say no worse; for though he has copied Aldrovandus in innumerable places, he never once mentions his name." But Lay thinks that Lister, by expressing himself in this manner, has not done justice to Moufet; and he maintains that the latter has rendered an essential service to the republic of letters.

Moujgur ‖ Moulds.

MOUJGUR, a town of Hindustan, in the province of Ajmeer. It is surrounded with a high wall and towers, and has a conspicuous mosque, which stands over the gateway, and a tomb with a cupola ornamented with painted tiles. Its situation is in the middle of the desert of Bicaneer; but it has several good wells, and reservoirs of rain water. It belongs to a Mahommedan chief, whose capital, Bahawulpore, stands on the bank of the Gharra or Hyphasis River, and who is tributary to the king of Afghanistan. The inhabitants are partly Hindus and partly Mahommedans. Mr Elphinstone, on his embassy to Cabul in 1808, visited this place, and was hospitably entertained. Long. 72. 20. E. Lat. 28. 57. N.

MOULD, or Mold, in the mechanical arts, is a cavity artificially cut, with a design to give its form or impression to some softer matter applied therein. Moulds are implements of great use in sculpture, foundery, and other arts. The workmen employed in melting the mineral or metallic ore dug out of mines have their several moulds to receive the melted metal as it comes out of the furnace; but these are different according to the diversity of metals and works. In gold mines they have moulds for ingots, in silver mines for bars, in copper and lead mines for pigs or salmons, in tin mines for pigs and ingots, and in iron mines for sows, chimney backs, anvils, caldrons, pots, and other large utensils and merchandises of iron, which are here cast, as it were, at first hand.

Moulds of founders of large works, as statues, bells, guns, and other brazen works, are of wax, supported within-side by what we call a core, and covered without-side with a cape or case. It is in the space occupied by the wax, which is afterwards melted away to leave it free, that the liquid metal runs, and the work is formed, being carried thither through a great number of little canals, which cover the whole mould.

Moulds of moneyers are frames full of sand, in which the plates of metal are cast which are intended to serve for striking species of gold and silver.

A sort of concave moulds made of clay, having within them the figures and inscriptions of ancient Roman coins, are found in many parts of England, and supposed to have been used for casting money. Mr Baker having been favoured with a sight of some of these moulds discovered in Shropshire, bearing the same types and inscriptions with some of the Roman coins, gave an account of them to the Royal Society. They were found in digging for sand, at a place called Ryton in Shropshire, about a mile from the great Watling-street Road. They are all of the size of the Roman denarius, and of little more than the thickness of our halfpenny. They are made of a smooth pot or brick clay, which seems to have been first well cleansed from dirt and sand, and well beaten or kneaded, to render it fit for taking a fair impression. There were a great many of them found together, and some have not unfrequently been found in Yorkshire; but they do not seem to have been met with in any other place, except at Lyons, where several are said to have been discovered. They have been sometimes found in great numbers joined together side by side, on one flat piece of clay, as if intended for the casting of a great number of coins at once; and both these, and all the others that have been found, seem to have been of the Emperor Severus. They are sometimes found impressed on both sides, and several have the head of Severus on one side and a well-known reverse of his on the other. They seem plainly to have been intended for the coinage of money, though it is not easy to say in what manner they can have been employed for that purpose, especially those which have impressions on both sides, unless it may be supposed that they coined two pieces at the same time by

Moulds. the help of three moulds, of which this was to be the middle one. If, by disposing these into some sort of iron frame or case, as our letter-founders do the brass moulds for casting their types, the melted metal could be easily poured into them, it would certainly be a very easy method of coining, as such moulds require little time or expense to make them, and therefore new ones might be supplied as often as the old ones happened to break.

These moulds seem to have been burned or baked sufficiently to make them hard; but not so as to render them porous like our bricks, whereby they would have lost their smooth and even surface, which in these is plainly so close, that whatever metal should be formed in them would have no appearance like the sandholes by which counterfeit coins and metals are usually detected.

MOULDS of founders of small works are like the frames of coiners. It is in these frames, which are likewise filled with sand, that their several works are fashioned; and when the two frames of which the mould is composed are rejoined, the melted brass is run.

MOULDS of letter-founders are partly of steel and partly of wood. The wood, properly speaking, serves only to cover the real mould which is within, and to prevent the workman, who holds it in his hand, from being incommoded by the heat of the melted metal. Only one letter or type can be formed at once in each mould.

MOULDS, in the manufacture of paper, are little frames composed of several brass or iron wires, fastened together by another wire still finer. Each mould is of the dimensions of the sheet of paper to be made, and has a rim or ledge of wood to which the wires are fastened. These moulds are more usually called frames or forms.

MOULDS, with furnace and crucible makers, are made of wood, of the same form with the crucibles, that is, in the form of a truncated cone; they have handles of wood to hold and turn them with, when, being covered with the earth, the workman has a mind to round or flatten his vessel.

MOULDS for leaden bullets are little iron pincers, each branch of which terminates in a hemispherical concave, and these when shut form an entire sphere. In the lips or sides where the branches meet is a little jet or hole, through which the melted lead is conveyed.

Laboratory MOULDS are made of wood, for filling and driving all sorts of rockets, cartridges, and fuses.

Glaziers' Moulds. The glaziers have two kinds of moulds for casting their lead in. In the one, they cast the lead into long rods or canes fit to be drawn through the vice, and the grooves formed therein; and this they sometimes call ingot-mould. In the other, they mould those little pieces of lead a line thick and two lines broad, fastened to the iron bars. These may also be cast in the vice.

Goldsmiths' Moulds. The goldsmiths use the bones of the cuttle fish to make moulds for their small works, which they do by pressing the pattern between two bones, and leaving a jet or hole to convey the metal through, after the pattern has been taken out.

MOULDS, amongst masons, are pieces of hard wood or iron hollowed within-side, corresponding to the contours of the mouldings or cornices to be formed.

MOULDS, amongst plumbers, are the tables upon which they cast sheets of lead, and which they sometimes call simply *tables*. Besides these, they have other real moulds, with which they cast pipes without soldering.

MOULDS, amongst the glass-grinders, are wooden frames, on which they make the tubes wherewith they fit their perspectives, telescopes, and other optic machines. These moulds are cylinders, of a length and diameter according to the use they are to be applied to, but always thicker at one end than the other, to facilitate the sliding. The tubes made on these moulds are of two kinds; the one simply of pasteboard and paper, and the other of thin leaves of wood joined to the pasteboard. To make these tubes to draw out, the last or innermost only is formed on the mould; each tube made afterwards serving as a mould to that which is to go over it, but without taking out the mould from the first. Moulds ‖ Mound.

MOULDS used in basket-making are very simple, consisting ordinarily of a willow or osier turned or bent into an oval, circle, square, or other figure, according to the baskets, panniers, hampers, and other utensils intended. On these moulds they make, or more properly measure, all their work; and accordingly they have them of all sizes and shapes.

MOULD, in ship-building, a thin, flexible piece of timber, used by shipwrights as a pattern whereby to form the different curves of the timbers, and other compassing pieces in a ship's frame. There are two sorts of these, viz. the bend mould and hollow mould. The former of these determines the convexity of the timbers, and the latter their concavity on the outside, where they approach the heel, particularly towards the extremities of the vessel. The figure given to the timbers by this pattern is called their *bevelling*.

MOULDS, amongst tallow-chandlers, are of two kinds. The one for the common dipped candles, being the vessel in which the melted tallow is disposed, and the wick dipped, is of wood, of a triangular form, and supported on one of its angles, so that it has an opening of near a foot a-top. The other, used in the fabric of mould candles, is of brass, pewter, or tin.

MOULD, amongst gold-beaters, a certain number of leaves of vellum or pieces of gut, cut square of a certain size, and laid over one another, between which they put the leaves of gold and silver which they beat on the marble with the hammer.

MOULDING, any thing cast in a mould, or which seems to have been so, although in reality it were cut with a chisel or the axe.

MOULDINGS, in *Architecture*, projections beyond the naked wall, column, or wainscot, the assemblage of which forms cornices, door-cases, and other decorations of architecture.

MOULINET is used, in *Mechanics*, to signify a roller, which being crossed with two levers, is usually applied to cranes, capstans, and other sorts of engines, to draw ropes, heave up stones, and the like.

MOULINET is also a kind of turnstile or wooden cross, which turns horizontally upon a stake fixed in the ground. It is usually placed in passages, to keep out horses, and to oblige passengers to pass one by one. These moulinets are often set near the outworks of fortified places at the sides of the barriers, through which people pass on foot.

MOULINS, an arrondissement in the department of the Allier, in France, 963 square miles in extent. It is divided into nine cantons and eighty-five communes, and contains a population of 96,582 persons. The capital is the city of that name, situated on the left bank of the Allier, over which there is a fine stone bridge 1080 feet in length. It has good streets, regularly built, and is surrounded with pleasing promenades. In the year 1836 it contained 15,231 inhabitants, who carry on the trades of making jewellery, cutlery of the finer kinds, and some linen and cotton goods. Long. 2. 14. E. Lat. 46. 34. N.

MOULTING, or MOLTING, the falling off or change of hair, feathers, skins, horns, or other parts of animals, happening in some annually, and in others only at certain stages of life. The generality of animals moult in the spring. The moulting of a hawk is called *mewing*. The moulting of a deer is the shedding of his horns in February or March. The moulting of a serpent is the peeling off of his skin.

MOUND, a term used for a bank, rampart, or other fence, particularly that of earth.

Mound ‖ Mountain.

MOUND, in *Heraldry*, a ball or globe with a cross upon it, such as our kings are usually drawn with, holding it in their left hand, as they do the sceptre in the right.

MOUNT EDGECUMBE, a prodigiously high peak, at the entrance of Cook's Strait, in New Zealand, on the west side. Its height is supposed not to be much inferior to that of the Peak of Teneriffe.

MOUNT SORREL, a town of the county of Leicester, in the hundred of West Goscote, 105 miles from London, on the great north-west road by Manchester to Scotland. It stands in two parishes, Barrow and Rothley, on a rugged hill overlooking the river Soar. It had a castle of great strength, which was destroyed by the country people in 1217, on account of the depredations committed by the garrison. The population amounted in 1801 to 1233, in 1811 to 1502, in 1821 to 1422, and in 1831 to 1602.

MOUNTS *of Piety*, certain funds or establishments in Italy, where money is lent out on some small security. There were also mounts of piety in England, raised by contribution, for the benefit of people ruined by the extortions of the Jews.

MOUNTAIN, a considerable eminence of land, elevated above the surrounding country. It is commonly full of inequalities, cavities more or less exposed, and strata uncovered.

The *Attraction of* MOUNTAINS is a comparatively recent discovery, and affords a very considerable confirmation of Sir Isaac Newton's theory of universal gravity. According to the Newtonian system, an attractive power is not only exerted between those large masses of matter which constitute the sun and planets, but likewise between all comparatively smaller bodies, and even between the smallest particles of which they are composed. Agreeably to this hypothesis, a heavy body, which ought to gravitate or tend towards the centre of the earth, in a direction perpendicular to its surface, supposing the said surface to be perfectly even and spherical, ought likewise, though in a less degree, to be attracted and tend towards a mountain placed upon the earth's surface; so that the plumb-line, for instance, of a quadrant, hanging in the neighbourhood of such a mountain, ought to be drawn from a perpendicular situation, in consequence of the attractive power of the quantity of matter of which it is composed, acting in a direction different from that exerted by the whole mass of matter in the earth, and with a proportionally inferior degree of force.

Though Sir Isaac Newton had long ago hinted at an experiment of this kind, and had remarked, that "a mountain of an hemispherical figure, three miles high and six broad, would not, by its attraction, draw the plumb-line two minutes out of the perpendicular;"[1] yet no attempt to ascertain this matter by actual experiment was made till about the year 1738, when the French academicians, particularly MM. Bouguer and Condamine, who were sent to Peru to measure a degree under the equator, attempted to discover the attractive power of Chimboraço, a mountain in the province of Quito. According to their observations, which however were made under circumstances by no means favourable to an accurate solution of so nice and difficult a problem, the mountain of Chimboraço exerted an attraction equal to about eight seconds. Though this experiment was not perhaps sufficient to prove satisfactorily even the reality of an attraction, much less the precise quantity of it, yet it does not appear that any steps have since been taken to repeat it.

Through the munificence of his Britannic majesty, the Royal Society were enabled to undertake the execution of this delicate and important experiment; and the astronomer royal was chosen to conduct it. After various inquiries, the mountain of Schehallien, situated nearly in the centre of Scotland, was pitched upon as the most proper for the purpose that could be found in this island. The observations were made by taking the meridian zenith distances of different fixed stars near the zenith, by means of a zenith sector of ten feet radius; first on the south, and afterwards on the north side of the hill, the greatest length of which extended in an easterly and westerly direction. Mountain.

It is evident, that if the mass of matter in the hill exerted any sensible attraction, it would cause the plumb-line of the sector, through which an observer viewed a star in the meridian, to deviate from its perpendicular situation, and would attract it contrariwise at the two stations, thereby doubling the effect. On the south side, the plummet would be drawn to the northward by the attractive power of the hill placed to the northward of it; and on the north side, a contrary and equal deflection of the plumb-line would take place in consequence of the attraction of the hill, now to the southward of it. The apparent zenith distances of the stars would be affected contrariwise; those being increased at the one station which were diminished at the other; and the correspondent quantities of the deflection of the plumb-line would give the observer the sum of the contrary attractions of the hill, acting on the plummet at the two stations; so that the half would of course indicate the attractive power of the hill.

The various operations requisite for performing this experiment lasted about four months; and from them it appears that the sum of the two contrary attractions of the mountain of Schehallien, in the two temporary observations which were successively made half way up the hill (where the effect of its attraction would be greatest), was equal to 11″·6. From a rough computation, founded on the known law of gravitation, and on an assumption that the density of the hill is equal to the mean density of the earth, it appears that the attraction of the hill should amount to about the double of this quantity. From this it was inferred that the density of the hill is only about half the mean density of the earth. It does not appear, however, that the mountain of Schehallien has ever been a volcano, or is hollow, as it is extremely solid and dense, and seemingly composed of an entire rock. The inferences drawn from these experiments may be reduced to the following.

1. It appears that the mountain of Schehallien exerts a sensible attraction; therefore, by the rules of philosophizing, we are warranted to conclude, that every mountain, and indeed every particle of the earth, is endowed with the same property, in proportion to its quantity of matter.

2. The law of the variation of this force, in the inverse ratio of the squares of the distances, as laid down by Sir Isaac Newton, was also confirmed by this experiment. For if the force of attraction of the hill had been only to that of the earth, as the matter in the hill to that of the earth, and had not been greatly increased by the near approach to its centre, the attraction thereof must have been wholly insensible. But now, by only supposing the mean density of the earth to be double that of the hill, which seems very probable from other considerations, the attraction of the hill will be reconciled to the general law of the variation of attraction in the inverse duplicate ratio of the distances, as deduced by Sir Isaac Newton from the comparison of the motion of the heavenly bodies with the force of gravity at the surface of the earth; and the analogy of nature will be preserved.

3. We may now, therefore, be allowed to admit this law, and to acknowledge that the mean density of the earth is at least double of that at the surface, and consequently that the density of the internal parts of the earth

[1] By a very easy calculation, it is found that such a mountain would attract the plumb-line 1′ 18″ from the perpendicular.

Mountain of Forty Days.

is much greater than near the surface. Hence, also, the whole quantity of matter in the earth will be at least as great again as if it had been all composed of matter of the same density with that at the surface, or will be about four or five times as great as if it were all composed of water. This conclusion, Dr Maskelyne adds, is totally contrary to the hypothesis of some naturalists, "who suppose the earth to be only a great hollow shell of matter, supporting itself from the property of an arch, with an immense vacuity in the midst of it." But were that the case, the attraction of mountains, and even smaller inequalities in the earth's surface, would, contrary to experiment, be very great, and would affect the measures of the degrees of the meridian much more than we find they do; and the variation of gravity, in different latitudes, in going from the equator to the poles, as found by pendulums, would not be near so regular as it has been found by experiment to be.

4. As mountains are by these experiments found capable of producing sensible deflections of the plumb-lines of astronomical instruments, it becomes a matter of great importance, in the mensuration of degrees in the meridian, either to choose places where the irregular attraction of the elevated parts may be small; or where, by their situation, they may compensate or counteract the effects of each other.

MOUNTAIN *of Forty Days*, a mountain of Judæa, situated in the plain of Jericho, to the north of that city. According to the Abbé Mariti's description, the summit of it is covered neither with shrubs, nor turf, nor earth; it consists of a solid mass of white marble, the surface of which has become yellow by the injuries of the air. "The path by which you ascend to it," says this writer, "fills one with terror, as it rises with a winding course between two abysses, which the eye dares scarcely behold. This path is at first pretty broad, but it at length becomes so confined, that one can with difficulty place both feet upon it at the same time. When we had ascended a little higher, we found an Arab stretched out on the path, who made us pay a certain toll for our passage. Here the traveller requires courage. One of the parapets of the path being broken, we clung to the part which remained until we had reached a small grotto, situated very commodiously, as it gave us an opportunity of recovering our breath. When we had rested ourselves a little, we pursued our course, which became still more dangerous. Suspended almost from the rock, and having before our eyes all the horror of the precipice, we could advance only by dragging one foot after the other; so that had the smallest fragments given way under us, we should have been hurried to the bottom of this frightful abyss.

"This mountain is one of the highest in the province, and one of its most sacred places. It takes its name from the rigorous fast which Christ observed here after having triumphed over the vanities of the world and the power of hell. In remembrance of this miracle, a chapel was formerly constructed on the summit of the mountain. It may be seen from the plain, but we could not approach it, as the path was almost entirely destroyed. It, however, may be accessible on the other side of the mountain, which we did not visit. A great many scattered grottos are seen here; in one of which, according to Quaresmius, were deposited the bodies of several anchorets, which are still entire. I have heard the same thing asserted in the country, but I could never meet with any person who had seen them. Here we enjoyed the most beautiful prospect imaginable. This part of the Mountain of Forty Days overlooks the mountains of Arabia, the country of Gilead, the country of the Ammonites, the plains of Moab, the plain of Jericho, the river Jordan, and the whole extent of the Dead Sea. It was here that the devil said to the Son of God, 'All these kingdoms will I give thee, if thou wilt fall down and worship me.'"

Mountains of the Lions ‖ Mourning.

MOUNTAINS *of the Lions*, also in Africa, divide Nigritia from Guinea, and extend as far as Ethiopia. They were styled by the ancients the Mountains of God, on account of their being greatly subject to thunder and lightning.

MOUNTAINS *of the Moon*, a chain of mountains in Africa, extending between Abyssinia and Monomotapa, and so called from their great height.

Marble MOUNTAINS. Of these there are great numbers in Egypt, from which, although immense quantities have been carried off for the multitudinous works erected by the ancient Egyptians, yet, in the opinion of Bruce, there is still a sufficient supply to build Rome, Athens, Corinth, Syracuse, Memphis, Alexandria, and half a dozen more of such cities.

MOURNING, a particular dress or habit worn to signify grief upon some melancholy occasion, particularly the death of friends or of great public characters. The modes of mourning are various in different countries, as are also the colours used for that purpose. In Europe, the ordinary colour for mourning is black; in China, it is white; in Turkey, blue or violet; in Egypt, yellow; in Ethiopia, brown. White formerly obtained in Castille on the death of their princes; and Herrera observes, that the last time it was used was in 1498, on the death of Prince John. Each people pretend to have their reasons for the particular colour of their mourning; white is supposed to denote purity; yellow indicates that death is the end of human hopes, because leaves when they fall, and flowers when they fade, become yellow; brown denotes the earth, whither the dead return; black signifies the privation of life, as being the privation of light; blue expresses the happiness which it is hoped the deceased enjoys; and purple or violet betokens sorrow on the one side, and hope on the other, as being a mixture of black and blue.

MOURNING, amongst the ancients, was, as might be expected, expressed in a great variety of ways.

Amongst the Jews, on the death of their relations or intimate friends, grief or mourning was signified by weeping, tearing their clothes, smiting their breasts or tearing them with their nails, pulling or cutting off their hair and beards, walking softly, that is, barefooted, lying upon the ground, fasting, or eating upon the ground. They kept themselves closely shut up in their houses, covered their faces, and abstained from all work, even reading the law and saying their usual prayers. They neither dressed, nor made their beds, nor shaved themselves, nor cut their nails, nor went into the bath, nor saluted any body; so that sulkiness appears to have been an indication of sorrow, and dirtiness of distress. The time of mourning amongst the Jews was generally seven days, though this was lengthened or shortened according to circumstances; but thirty days were thought sufficient upon the severest occasions. The different periods of the time of mourning required different degrees of grief, and different tokens of it.

The Greeks, upon the death of friends, showed their sorrow by secluding themselves from all gaiety, especially entertainments, games, public solemnities, the enjoyment of wine, and the delights of music. They sat in gloomy and solitary places, stripped themselves of all external ornaments, put on a coarse black stuff by way of mourning, tore their hair, shaved their heads, rolled themselves in the dust and mire, sprinkled ashes upon their heads, smote their breasts with their palms, tore their faces, and frequently cried out with a lamentable voice and drawling tone, reiterating the interjection ε, ε, ε, ε. Hence funeral lamentations were called Ελεγοι. If they appeared in public during the time of mourning, they had a veil thrown over their faces and heads. During the funeral procession, certain persons called ἐξαρχοι θρηνων, marched before, and sung melancholy strains. These vocal mourners sung thrice during the procession round the pile and round the grave. Flutes were also used

Moussyre || Mozambique.

to heighten the solemnity. At the funerals of soldiers, their fellow-soldiers who attended, as a testimony of their affliction, held their shields, their spears, and the rest of their armour, inverted.

The tokens of private grief amongst the Romans were nearly the same as those already observed as customary amongst the Greeks. Black or dark brown were the colours of the mourning habits worn by the men; and they were also common to the women. The mourning of the emperors at first was black. In the time of Augustus, the women wore white veils, but the rest of their dress was black. From the time of Domitian they wore nothing but white habits, without any ornaments of gold, jewels, or pearls. The men let their hair and beards grow, and wore no wreaths of flowers on their heads whilst the days of mourning continued. The longest time of mourning was ten months. This was Numa's establishment, and included his whole year. During this time it was infamous for a widow to marry. Mourning was not used for children who died under three years of age. From this age to ten they mourned as many months as the child was years old. A remarkable victory, or other happy event, occasioned the shortening of the time of mourning. The birth of a child, or the attainment of any remarkable honour in the family, certain feasts in honour of the gods, or the consecration of a temple, had the same effect. After the battle of Cannæ, the commonwealth decreed that mourning should not be worn for more than thirty days, that the loss sustained might be forgotten as soon as possible. When public magistrates or persons of great note died, also when any remarkable calamity happened, all public meetings were intermitted, the schools of exercise, baths, shops, temples, and all places of concourse, were shut up, and the whole city put on an appearance of sorrow; the senators laid aside the *laticlave*, and the consuls sat in a lower seat than ordinary. This was also the custom of Athens, and was observed upon the death of Socrates, not long after he had been sentenced to death by their judges.

Præficæ, or mourning women, went about the streets. This was customary amongst the Jews as well as the Greeks and Romans (Jerem. ix. 17).

MOURZOUK, the capital of Fezzan, see that article.

MOUSSYRE, one of the Kurile Islands, resorted to by the Russians for sea-birds and aquatic animals.

MOUZILLON, a town of France, in the department of the Lower Loire, and arrondissement of Nantes. It is situated on the river Gaugueise, and, including the parish, contains 3100 inhabitants, who chiefly cultivate the vine, and produce the best wine of the department.

MOW is the name of several towns in Hindustan, the principal of which is in the province of Agra, and district of Furukabad. Long. 79. 18. E. Lat. 27. 34. N. This is also the name of a town in the district of Allahabad, fifty-three miles north-east from Benares; and of another seventy-six miles from Benares.

MOXA, or Mugwort of China, is a soft lanuginous substance, prepared in Japan from the young leaves of a species of *artemisia*, by beating them together when thoroughly dried, and rubbing them between the hands till only the fine fibres are left. The down upon the leaves of mullein, cotton, hemp, &c. answers the same purpose.

In the eastern countries it is used by burning it on the skin. A little cone of the moxa is laid upon the part, previously moistened, and set on fire at the top; it burns down with a temperate glowing heat, and produces a dark-coloured spot, the exulceration of which is promoted by applying a little garlic; and the ulcer is left to discharge, or is soon healed, according to the intention in using the moxa.

MOZAMBIQUE, or Mosambique, a portion of the eastern coast of Africa, of which the limits are not very well defined, and about which little is known. It is sometimes called a kingdom, and was doubtless once entitled to that designation; but it is now a Portuguese colony. It takes its name from the capital, which is built on an island, the principal of three islands forming a part of the territory. The roadstead is good, and the pier commodious, but the situation is by no means either healthy or convenient. This city is said to have been once very handsome, but no recent traveller ascribes to it this characteristic. Although it derives its importance from being the emporium of the gold, ivory, and slaves brought down the Tambeze, it lies about three hundred miles from the mouth of that river, and the trade is in a great measure transferred to Quillimane. The principal inhabitants have their houses at Mesuril, on the continent, at the extremity of the peninsula of Caboceiro. There is a fort, of strength sufficient to defend it against pirates, but not against the attack of a regular force. The government-house still retains vestiges of its former splendour when in possession of the viceroys. Like the custom-house, and almost all the other public structures, it is spacious, and built of stone, but is fast falling into decay. The trade in slaves, once most extensive, has considerably declined since the British obtained possession of Madagascar and the Cape, into which colonies they prohibit their importation. In 1818 the number exported was estimated at above eight thousand, but no recent authorities inform us how much it has decreased. The other chief branches of commerce are gold and ivory. The governor, and even his negro attendants, are richly loaded with golden ornaments; and household utensils, made of that precious metal, are used in his establishment. The dominion of the Portuguese scarcely extends beyond the peninsula of Caboceiro; and they are with difficulty able, by alliance with the chiefs of Quintangone and Sereime, to make head against the Makooa, a populous and warlike tribe, occupying a great extent of the coast. According to the narrative of Captain Owen, the population amounts to about 6000.

Mozart.

MOZART, John Chrysostom-Wolfgang-Theophilus, the illustrious musical composer, was born at Salzburg, on the 27th of January 1756. He was the son of Leopold Mozart, a musician in the employment of the Prince-archbishop of Salzburg, and Anna Maria Pertl. Both parents were noted for their uncommon beauty. Mozart was scarcely three years old when he manifested the most astonishing disposition for music. With an instinctive perception of beauty, his great delight was to seek for *thirds* on the piano, and nothing could equal his joy when he found this harmonious chord. At the age of four his father taught him some minuets, and other pieces of music. Mozart would learn a minuet in half an hour, and a longer piece in less than twice that time; and immediately afterwards, he played them with remarkable clearness, and perfectly in time. Before he was six, he had invented several small pieces himself, and even attempted compositions of some extent and intricacy. The vivacity of his mind led him to attach himself easily to every new object that was presented to him. He pursued the usual tasks of childhood with ardour; and when learning arithmetic, covered the tables, chairs, and walls with figures which he had chalked upon them. Music, however, soon became his favourite study, and in his juvenile efforts in composition, he showed a consistency of thought and a symmetry of design which promised a maturity of the highest genius.

One day, his father returning from church with a friend, found his son busy writing. "What are you doing there, my little fellow?" he asked. "I am composing a concerto for the harpsichord, and have almost got to the end of the first part." "Let us see this fine scrawl." "No, I have not yet finished it." The father, however, took the paper,

Mozart. and showed his friend a sheet full of notes, which could scarcely be deciphered for the blots of ink. The two friends at first laughed at this heap of scribbling; but after regarding it a little more seriously, the father's eyes overflowed with tears of joy and wonder. "Look, my friend," said he, with a smile of delight, "every thing is composed according to rule. It is a pity the piece cannot be made any use of; but it is too difficult; nobody would be able to play it." "It is a concerto," replied the son, "and must be studied till it can be properly played. This is the style in which it ought to be executed." He accordingly began to play, but succeeded only so far as to give them an idea of what he intended.

The extraordinary precocity of his son's genius induced Leopold Mozart to exhibit him at the different courts in Germany. As soon therefore as Wolfgang had attained his sixth year, the Mozart family, consisting of the father, mother, a young daughter who had made very considerable proficiency on the harpsichord, and Wolfgang, took a journey to Munich. This expedition succeeded in every respect. The young artists, delighted at the reception which they had met with, redoubled their application, and acquired a degree of execution on the piano, which no longer required the consideration of their youth to render it remarkable. During the autumn of the year 1762, the whole family repaired to Vienna, where the children performed before the court. Here they met with the celebrated Wagenseil. When Mozart, who knew already how to esteem the approbation of a great master, sat down to play before the Emperor Francis, he asked his majesty, "Is not M. Wagenseil here? we must send for him; he understands these things." The emperor sent for Wagenseil, and gave up his place to him at the side of the piano. "Sir," said Mozart to the composer, "I am going to play one of your concertos; you must turn over the leaves for me."

Hitherto the young Mozart had only played upon the harpsichord. On his return from Vienna to Salzburg, he brought with him a small violin, and amused himself with it. Wenzl, a skilful violin player, came to consult Leopold Mozart about some trios he had written. It was proposed to try the music. The father played the bass, Wenzl the first violin, and Schachtner, the archbishop's trumpeter, was to have played the second; but Wolfang insisted so much on being allowed to take this part, that his father at last consented to his playing it on his little violin. It was the first time he had heard his son seriously attempt this instrument, which, to the astonishment and delight of the party, he played with marvellous precision.

Every day afforded fresh proofs of Mozart's exquisite organization for music. He could distinguish and point out the slightest differences of sound; and every false or even rough note, not softened by some chord, was a torture to him. It was from this cause that, during the early part of his childhood, and even till he had attained his tenth year, he had an insurmountable horror for the trumpet when it was not used merely as an accompaniment. The sight of this instrument produced upon him much the same impression as that of a loaded pistol does upon other children when pointed at them in sport. His father thought he could cure him of this fear by causing the trumpet to be blown in his presence, notwithstanding his son's entreaties to be spared that torment; but at the first blast the boy turned pale, fell upon the floor, and would probably have been in convulsions if they had not immediately ceased.

In 1763, when Mozart was in his seventh year, his family set out upon their first expedition beyond the boundaries of Germany; and it is from this period that the celebrity of the name of Mozart in Europe is to be dated. They visited Paris and many other cities on the Continent; and in the year 1764 came to London, where the children played before the king. Mozart also played the organ at the Chapel Royal; and with this the king was even more pleased than with his performance on the harpsichord. During this visit, he composed six sonatas, which he dedicated to the queen. He afterwards returned to France, whence he proceeded to Holland and Switzerland; and on his arrival at his native place in 1766, he composed, at the request of the Emperor Joseph, the music of an opera-buffa called the *Finta Semplice,* which was approved of by Hasse and Metastasio. At the dedication of the Church of the Orphans he composed the music of the mass, and directed this solemn service, in the presence of the imperial court, although he was at that period only twelve years old. Mozart.

In the month of December 1769, his father took him to Italy, and in every city met with an enthusiastic reception. Young Mozart had not as yet ventured out of the beaten track of composers; but, preserving the old forms of melody and harmony, he wrote in a style which was particularly learned and correct. His operas at this period were thought to have an air of stiffness, from the centrapuntal knowledge which they exhibited. What principally distinguished him from other composers, was the facility with which he scored, and the extraordinary fluency of his ideas. It was probably, too, from reading Metastasio at this period that Mozart's taste in lyric poetry was formed; for in maturer life he was fastidious in the choice of the words he set to music, and the uninterrupted flow of melody and versification distinguished his airs from those of any other composer. Another circumstance of the Italian tour, which proved influential upon the after life of Mozart, was the daily hearing of the highest and most pathetic style of church music, Italy having in the latter part of the last century produced some of her greatest ecclesiastical works. In the celebrated *Requiem*, which was composed purely from love of the *expressive* in sacred music, we may discover the result of the author's young devotion to this branch of the art, the consequence of listening to choral effects in the cathedrals of Italy.

Mozart having engaged to produce the first opera for the carnival of Milan, our travellers proceeded to Bologna, where Wolfgang found an enthusiastic admirer in Padre Martini, who was astonished to find a boy of fourteen years old capable of giving answers instantly in the *rigore modi*, to any subject of fugue laid before him. In Rome Mozart gave a miraculous attestation of his quickness of ear and extensive memory, by bringing away from the Sistine Chapel the *Miserere* of Allegri, a work full of imitation and repercussion, mostly for a double choir, and continually changing in the combination and relation of the parts. He drew out a sketch of this celebrated composition upon the first hearing, and filled it up from recollection at home. He then repaired to the second and last performance with his manuscript in his hat, and corrected it. He afterwards produced his copy at a concert in Rome, and one of the singers who sang at the performance of the *Miserere* pronounced it perfect. Mozart thus became famous in Rome, a city where it was most difficult to excite attention in any thing relating to the fine arts, on account of the numerous productions of art which were then every day presented, and formed subjects of constant and familiar contemplation.

In December 1770, the first representation of his opera, *Mitridate Re di Ponto*, took place at Milan. It met with remarkable favour, and was performed twenty nights in succession. He afterwards wrote several other operas, one of which, entitled *Lucio Silla*, was likewise represented twenty times. But the epoch at which Mozart's genius ripened may be dated from his twentieth year. Constant study and practice had given him ease in composition, and ideas came thicker with his early manhood. The fire, the

Mozart. melodiousness, the boldness of harmony, the inexhaustible invention, which characterize his works, were at this time apparent. He began to think in a manner entirely independent, and to perform what he had promised as a regenerator of the musical art.

Mozart produced his first great opera, *Idomeneo*, in his twenty-fifth year. He was then enamoured of Mademoiselle Constance Weber, a celebrated actress, whom he afterwards married. The family of his mistress having opposed the match, on account of his unsettled habits and situation, he was desirous of showing them that, although he had no recognised rank in society, he nevertheless possessed the means of obtaining consideration; and his attachment to Constance supplied him with the subjects of the impassioned airs which his work required. The love and vanity of the young composer, thus stimulated to the highest pitch, enabled him to produce the opera of *Idomeneo*, which he always regarded as one of his best, and from which he has frequently borrowed ideas for his subsequent works.

Mozart being now happily married and settled, gave himself up to his profession. In 1787 he produced *Le Nozze di Figaro*, and *Il Don Giovanni*, and afterwards his *Cosi fan Tutte*, and *La Clemenza di Tito*, an opera of Metastasio, which was performed for the first time in 1792. He wrote only three German operas, *Die Zauberflöte*, *Die Entführung aus dem Serail*, and *Der Schauspieldirector*.

His works composed for the stage consist altogether of twelve operas. He left seventeen symphonies and instrumental pieces of all kinds, besides masses and other church compositions. He was one of the first piano-forte performers in Europe. He played with extraordinary rapidity, and the execution of his left hand was especially admired. Haydn said, "I never can forget Mozart's playing; it went to the heart."

Entirely absorbed in music, this great man was a child in almost every other respect. His hands were so wedded to the piano, that he could use them for nothing else. At table his wife carved for him; and in every thing relating to money, or to the management of his domestic affairs, or even the choice and arrangement of his amusements, he was entirely under her guidance. But, seated at the piano-forte, he appeared a being of another order. His mind then took wing, and his whole attention was directed to the development of his art. His health was very delicate, and during the latter part of his too short life it declined rapidly. At times he laboured under a profound melancholy, and in this state he wrote *Die Zauberflöte*, the *Clemenza di Tito*, and his celebrated mass in D minor, commonly known by the name of his *Requiem*. The circumstances which attended the composition of the last of these works are too remarkable to be omitted in any notice of the life of Mozart.

One day, when his spirits were unusually oppressed, a stranger, of a tall dignified appearance, was introduced. The manners of this stranger were grave and impressive, and he told Mozart that he came from a person who did not wish to be known, to request he would compose a solemn mass, as a requiem for the soul of a friend whom he had recently lost, and whose memory he was desirous of commemorating by this solemn service. Mozart undertook the task, and engaged to have it completed in a month. The stranger begged to know what price he set upon his work, and having immediately paid him a hundred ducats, took his leave. The mystery of this visit seemed to have a very strong effect upon the mind of the musician. He brooded over it for some time, and then suddenly calling for writing materials, began to compose with extraordinary ardour. This application, however, was more than his strength could support; it brought on fainting fits, and his increasing illness obliged him to suspend his work. "I am writing this Requiem for myself," said he abruptly to his wife one day; "it will serve for my own funeral service;" and this impression never afterwards left him. At the expiration of the month, the mysterious stranger appeared, and demanded the Requiem. "I have found it impossible," said Mozart, "to keep my word; the work has interested me more than I expected, and I have extended it beyond my first design. I shall require another month to finish it." The stranger made no objection; but observing, that for this additional trouble it was but just to increase the premium, laid down fifty ducats more, and promised to return at the time appointed. Astonished at the whole proceedings, Mozart ordered a servant to follow this singular personage, and if possible find out who he was; the man, however, lost sight of him, and was obliged to return as he went. Mozart, now more than ever persuaded that he was a messenger from the other world sent to warm him that his end was approaching, applied with fresh zeal to the Requiem, and, in spite of the exhausted state both of his mind and body, completed it before the end of the month. At the appointed day the stranger returned; but Mozart was no more. He died on the 5th of December 1791, before he had completed his thirty-sixth year. Mozart.

The distinguishing characteristic of the music of Mozart is its power of touching the deepest feelings of the soul. He has been justly styled the Raffaelle of music. He had many of the fine qualities and modest perfections of the great painter, whom he also resembled in the fertility and variety of his genius. Mozart embraced his art in its whole extent, and excelled in all its departments. When, indeed, we bring into view all his qualifications as a composer and a practical musician, the result is astonishing. The same man, under the age of thirty-six, was at the head of dramatic, sinfonia, and piano-forte music; he was eminent in the sacred style, and equally at his ease in every variety, from the elaborate concerto to the simplest pieces of music. He put forth about eight hundred compositions, including masses, motetts, operas, and fragments of different kinds; at the same time supporting himself by teaching and giving public performances, at which he executed concertos on the piano-forte, the violin, the organ, or played extempore.

Of his operas, he esteemed most highly *Il Don Giovanni* and *Idomeneo*. He seldom spoke of his own works; but of the *Don Giovanni* he one day observed, "This opera was not composed for the public of Vienna; it is better suited to Prague: but, to say the truth, I wrote it only for myself and my friends." In this extraordinary production, so remarkable for exquisite melodies and profound harmonies, the playful, the tender, the pathetic, the mysterious, the sublime, and the terrible, may be distinctly traced. The composer exhibits throughout the work the most romantic imagination; and in the awful accompaniment to the reply of the statue, we have a specimen of composition replete with terrific expression, but at the same time perfectly free from inflation or bombast. The ghost scene in the last act may be considered as the greatest effort of dramatic composition. Well has the style of Mozart been described as that of Shakspeare in music. The fear of Leporello is painted with true comic spirit; a thing rather unusual with Mozart. But melancholy is the prevailing passion in this masterpiece; and so strong, so distinct, so real, is the imagery in which it is presented to the soul, that minds possessed of the least enthusiasm are sure to be moved.

We have already seen that the *Idomeneo* was the first work produced by Mozart that raised his name to celebrity as a dramatic composer. This opera, and the *Clemenza di Tito*, are, in the opinion of judges, considered as the two best serious operas extant. His opera of *Le Nozze di Fi-*

Mozgurrah ‖ Muckud.

garo is also much admired. In this piece, it must be admitted that Mozart has changed the picture of Beaumarchais. The spirit of the original is preserved only in the situations; all the characters are altered to the tender and impassioned. But although the brilliant wit of the French author has not been conveyed, yet, as a work of pure tenderness and melancholy, entirely divested of any unsuitable admixture of the majestic and the tragical, the *Nozze di Figaro* is unrivalled. It is difficult to form any idea of the *Zauberflöte*, without having seen it. The story, which is like the wandering of a delirious imagination, harmonizes admirably with the genius of the musician. The subject of *Cosi fan Tutte* is unsuitable to Mozart, who could not trifle with love. The tender parts of the characters in this opera are the best.

The sacred compositions of Mozart are celebrated all over Europe, and frequently performed in the Catholic churches. Of these works the most sublime is the *Requiem;* but several of his other masses and motetts are noted for their grandeur and beauty. His symphonies, quartetts, and other works for the orchestra and stringed instruments, rank in estimation with those of Haydn and Beethoven. His piano-forte writings are also justly esteemed. Mozart's sympathy was most extensive; he participated with Sebastian Bach in the beauty of the fugue, with Handel in the grandeur of church music, with Gluck in the serious opera, with Haydn in instrumental music, and in the universality of his genius surpassed them all.

In the exterior of Mozart there was nothing remarkable; he was diminutive in person, and had a very agreeable countenance, which, however, did not at the first glance discover the greatness of his genius. His eyes were tolerably large and well shaped, more heavy than fiery in the expression; and when he was thin they were rather prominent. His sight was quick and strong; but he had an unsteady, abstracted look, except when seated at the piano-forte, and then the whole form of his visage changed. His hands were small and beautiful, and he used them so softly and naturally upon the piano-forte, that the eye was no less delighted than the ear. His head was rather large in proportion to his body, but his hands and feet were in perfect symmetry. The stunted growth of Mozart's body may have arisen from the efforts of his mind. He was always good humoured, but very absent, and in answering questions seemed to be thinking of something else. Mozart had six children, but two sons only survived him. His widow married M. von Nissen, at Vienna, who published, in 1829, a full and excellent biographical account of the composer. (z. z.)

MOZGURRAH, a town of Hindustan, in the province of Moultan, sixty-five miles south-east from the town of Moultan. Long. 71. 51. E. Lat. 29. 48. N.

MUCHOO River, the largest river in the Gujerat peninsula, having its source in Sirdar, a few miles from Wankaneer, which it passes, and afterwards empties itself, by many mouths, into the Run.

MUCILAGE, in *Pharmacy*, is in general any viscid or glutinous liquor.

Mucilage also means the liquor which principally serves to moisten the ligaments and cartilages of the articulations, and is supplied by the mucilaginous glands.

MUCKEALAH, a town of Hindustan, and province of Lahore, belonging to the Sikhs. The neighbourhood is noted for the abundance of fossil salt. It is eighty-three miles north-west from the city of Lahore. Long. 72. 43. E. Lat. 32. 33. N.

MUCKONDABAD, a town of Hindustan, possessed by some independent chiefs, in the province of Gundwana, and twenty-five miles south from Reerah. Long. 81. 24. E. Lat. 24. 15. N.

MUCKUD, a town of Hindustan, belonging to the Afghans, in the province of Lahore, on the Indus. Long. 70. 51. E. Lat. 32. 22. N.

Muckundnauth ‖ Mueller.

MUCKUNDNAUTH, a town of Northern Hindustan, district of Lamjungh, and tributary to the Ghoorkali rajah of Nepaul. Long. 93. 50. E. Lat. 29. 38. N.

MUCKUNDRA, a village of Hindustan, in the province of Malwah, thirty miles south-south-east from Kotah, being situated in a circular valley at Chundkairy. Fourteen miles from this place is held one of the largest fairs in Hindustan. Long. 76. 12. E. Lat. 24. 48. N.

MUCUS, a mucilaginous liquor, secreted by certain glands, and serving to lubricate many of the internal cavities of the body. In its natural state it is generally limpid and colourless; but, from certain causes, it assumes a thick consistence and a whitish colour like pus.

MUDDIE, a fortified town of Hindustan, in the province of Gujerat, situated near the morass called the Run. The surrounding country is much infested with robbers. Long. 69. 22. E. Lat. 22. 5. N.

MUELLER, Johannes von, the only author whom Germany can oppose to the illustrious historians of Italy and Britain, was born at Schaffhausen in 1752, of which town his father was a pastor. In 1769, he commenced his academical life at Göttingen, where he applied himself principally to theology; a study and a profession which he soon deserted. In 1772, he was appointed professor of the Greek language in the gymnasium of his native town. In 1774, he removed to Geneva, where he principally resided till 1781. Here he delivered his lectures on Universal History, which were written originally in French; and here he formed the plan and commenced the investigations towards his History of the Helvetic Confederacy. In 1781 he was called, as professor of history, to the Carolinum of Brunswick, an appointment which he soon abandoned; and, the following year, he returned to Switzerland. By Heyne's recommendation, he was, in 1786, called as librarian, with the title of aulic counsellor, to Mentz. In 1800, he was appointed librarian to the imperial library at Vienna; in 1804, he was called as historiographer and counsellor of war to Berlin; and, in 1807, he was appointed minister, counsellor of state, and general director of public instruction in Cassel, where he died in 1809.

To enter into any detail regarding the history of Mueller's life is here the less requisite, as there perhaps never existed an author whose internal character was more independent of outward circumstances, or in whom the writer was in a more remarkable manner distinguished from the man; whilst, at the same time, his writings breathe the whole energy of the deep feelings of his ardent disposition. An honest enthusiasm for truth and virtue was combined in him with an ambition which could be satisfied only with the renown of a great author. No exertion of intellect was for him too painful; and no perseverance in industry surpassed his endurance. Of a cheerful disposition, even amidst the adversities of life, he pursued, without faultering, his determined object. From the letters which, in his youth, he wrote to his friend De Bonstetten, we see him at the beginning the same as at the termination of his course. But this very consistency renders the contrast between the two characters which he united in his person only the more remarkable. By nature amiable, but soft even to weakness; open and liberal, though without one conspicuous trait of magnanimity; accommodating himself to circumstances with the pliability of a courtier, and yielding to the seduction of his passions in a point where morality condemns him without appeal; yet no sooner had he seized his pen, no sooner had he begun to narrate the great events of former times, than this man became a hero at once in firmness and elevation; and this not by any artificial discipline of his imagination, but from a genuine and resistless enthusiasm in his own

Mueller.

moral delineations. It then became a necessity of his nature to think and write as if he himself had been one of the mighty warriors or statesmen, to glorify whose names it was his chief delight; now a Roman, now a Switzer of the ancient time, and now some other illustrious personage, whose character he superinduced upon his own in the moment of description. Moral and political grandeur had indeed for him so strong a charm, that he frequently deceived himself in his estimate of their amount.

With such a character of mind, Mueller could never be an historian who wrote only for the intellect, and still less an historian who wrote only for the memory. All that he read of remarkable persons and events became, in his imagination, a series of animated pictures. He must represent and paint, and he painted with few strokes, and happily, as if from life; whilst truth, as far as this could be discovered by historical research, was of greater value in his eyes than all the ornaments of rhetoric. His imagination was only active to place what he read before him in a living form. His historical delineations were inspired with the warmth of his peculiar temperament, but not misrepresented. As he himself was animated by whatever was good, and generous, and great, so he wished also to animate his reader by a sympathy with his portraits, and through the instructions which history conveys. But in Mueller's view, history must be instructive in a degree of which few historians have any conception. His free and clear intellect, adhering to no philosophical system, and with little inclination towards the abstract sciences in general, but penetrating deeply into the internal connection of historical events, was able to extract from this connection political and moral principles, which, though manifest even to the unlearned reader when placed before him, are overlooked even by the enlightened thinker when his observation is not guided by the legitimate deduction of causes and effects. And in this historical deduction, if we except Thucydides and Tacitus, Mueller has no superior. Not that he is equal to these great originals, nor even to some modern historians, in the detailed development of events, and in the arrangement of circumstances in the order of their absolute and relative importance. For the adequate attainment of this great end, Mueller was disqualified by a certain deficiency in the powers of abstraction and combination. The ideas, in his representation, display no regular subordination; and they are frequently crowded together, transposed, or dragged behind. In this respect he is more peculiarly opposed to Tacitus, although the Germans have fondly styled him the twin brother of that great historian, who, in the distinction of what is principal and accessory, has no equal, and almost no likeness, amongst the historians either of ancient or modern times. Thucydides and Tacitus he more nearly resembles in the energy and laconic brevity of his style. Pleased only with a strength and fulness of thought, he abhors all that is empty, or trivial, or redundant. Being impelled by youthful enthusiasm to write the history of his native Switzerland, and dwelling, as it were, for years amongst the original documents from which his materials were compiled, his powerful style insensibly contracted a certain antique colouring from the language of the ancient chronicles; and thus it is that his diction more vividly expresses the character of that peculiar period which, during the interval of composition, was then living in his own imagination. What was tasteless and offensive in the style of the old chronicles became softened down in Mueller's cultivated mind; but whilst his intellect was engrossed with the connection of events, a laconic brevity had for his individual taste an irresistible charm, even when purchased at the expense of easy and natural expression.

Mueller's History of the Helvetic Confederacy, the work on which he laboured longest, and to which he applied the whole force of his industry and talents, is the book in which we may best discover the spirit of his historical composition, in all its qualities both of comprehension and detail. But this work, one of the most singular productions of great historical intellect, requires so close an attention to a multitude of small matters of fact, the details of which might easily have been omitted, and, from the continued brevity, combined with the antiquated costume of the expression, exacts from the reader, unaccustomed to such a style, so vehement a stretch of thought, that we are ever and anon compelled to lay aside the book and breathe, in order to collect new strength for the perusal. Indeed, no book has, perhaps, been so much praised, and so little read, as the Helvetic History of our author. Mueller, who, from youth till death, and amidst literary and political occupations of another kind, always considered the history of his native country as the principal object of his life, had so accustomed himself to that character of composition which he thought accommodated to a history of Switzerland, that, in his other writings, he is not wholly able to divest himself of its peculiarities. His Universal History, first drawn up in French, for a society of young persons who were his pupils at Geneva, afterwards with greater care re-written in the German tongue, and first published after the author's death, though comprising, in abridgment, all ancient and modern ages, is, however, far inferior in historical value to the History of Switzerland; but the nature of its subject is more agreeable to the majority of readers; and in the condensation of the matter, the style has a certain facility, in which we easily recognise the man to whom French was in his youth a second mother tongue.

Of the other writings of Mueller, the most remarkable are the Letters, which were not written for the world, but published after his death in the collection of his works, of which they occupy several volumes. In these letters we discover the character of the man on its fairest and most honourable side; and we likewise see how far his style is removed from the affectation with which he has so often been reproached. Written rapidly, without premeditation, and addressed to confidential friends, the historian of the Helvetic Confederacy is recognised in every sentence of these letters; and the absence of a smooth and polished diction is in itself an excellence, when contrasted with the paint of letters written for admiration and display.

Muffle ‖ Muganayana.

MUFFLE, in *Chemistry*, a vessel employed in some metallurgic operations. In figure it represents an oblong arch or vault, the hinder part of which is closed by a semicircular plane, whilst the lower part or floor is a rectangular plane. It is a little oven, which is placed horizontally in assay and enamelling furnaces, so that its open side corresponds with the door of the fire-place of the furnace. Under this arched oven small cupels or crucibles are placed; and the substances contained are thus exposed to intense heat, without contact of fuel, smoke, or ashes.

MUFTI, the chief of the ecclesiastical order, or primate of the Mussulman religion. The authority of the mufti is very great in the Ottoman empire; for even the sultan himself, if he would preserve any appearance of religion, cannot, without hearing his opinion, put any person to death, or so much as inflict any corporal punishment. In all actions, especially criminal ones, his opinion is required, by giving him a writing, in which the case is stated under feigned names, and which he subscribes with the words, *He shall*, or *shall not, be punished.* Such outward honour is paid to the mufti, that the grand signior himself rises up to him, and advances seven steps to meet him when he comes into his presence.

MUGANAYANA, a town of the south of India, in the province of Mysore. It contains about 200 houses, and is fortified with a mud wall. Long. 76. 58. E. Lat. 13. 8. N.

Muggletonians || Mulheim.

MUGGLETONIANS, a religious sect which arose in England about the year 1657, and were so denominated from their leader Lodowick Muggleton, a journeyman tailor, who, with his associate Reeves, set up for great prophets, pretending, as it is said, to have an absolute power of saving and damning whomsoever they pleased; and giving out that they were the two last witnesses of God who should appear before the end of the world.

MUGLITZ, a city of the circle of Olmutz, in the Austrian province of Moravia. It stands on the river March, is surrounded with walls, and is the see of an archbishop, whose cathedral is there. It contains 368 houses, and 3013 inhabitants, some of whom are occupied in woollen manufactures.

MUGLEE, a town of Hindustan, in the Eastern Ghauts, ninety-five miles west from Madras. Long. 79. 5. E. Lat. 13. 10. N.

MUHLHAUSEN, a city of France, in the department of the Upper Rhine, and the arrondissement of Aldkirch. It stands on an island formed by the river Ill, which empties itself into the Rhine. It is the most considerable manufacturing place of the industrious department in which it stands, and is situated in a district of peculiar fertility. In the year 1836 it contained 13,300 inhabitants, who produce vast quantities of cotton goods of all kinds, and whose printed calicoes, both for design and colouring, far excel those of any other part of France. It produces also some valuable chemical preparations. It formed part of the Swiss confederacy till it was united to France in 1798. It is the birthplace of the celebrated mathematician Lambert. Long. 7. 22. E. Lat. 47. 50. N.

MULATTO, a name given in the Indies to those who are begotten by a negro man on an Indian or white woman, or by an Indian or white man on a negro woman.

MULCT, a fine of money laid upon a man who has committed some fault or misdemeanour.

MULE, a mongrel kind of quadruped, usually generated between an ass and a mare, and sometimes between a horse and a she-ass; but the signification of the word is commonly extended to every kind of animal produced by a mixture of two different species.

Mules, amongst gardeners, denote a sort of vegetable monsters produced by putting the *farina fœcundans* of one species of plant into the pistil or utricle of another. The carnation and sweet-william being somewhat alike in their parts, particularly their flowers, the farina of the one will impregnate the other, and the seed so enlivened will produce a plant differing from either.

MULHARA, a town of Hindustan, in the province of Allahabad, five miles north-north-east from Chatterpoor. Long. 79. 55. E. Lat. 25. N.

MULHAUSEN, a city of Prussia, in the government of Erfurt, the capital of the circle of the same name. It stands on the rivers Unstruth and Schwemotte, is surrounded with walls, and is divided into the upper and lower city, which, with the suburbs, contains 1672 houses, and 10,450 inhabitants. It has manufactories for various kinds of woollen goods, many breweries and distilleries, and several oil-mills. Long. 10. 23. 25. E. Lat. 51. 12. 59. N.

MULHEIM, a town of the Prussian government of Cologne, the capital of a circle of the same name. It has a church for each of the three religions, and a synagogue for the Jews, and contains 523 houses, and 3950 inhabitants. There is here a considerable manufactory of silks and velvets, and a good deal of traffic on the Rhine.

Mulheim, a city of the Prussian government of Dusseldorf, in the circle of Essen. It stands on the river Ruhr, and contains 700 houses, and 5650 inhabitants, who make much cotton-twist, woollen cloths, and paper, and carry on a considerable trade on the Rhine. There are several establishments for building vessels.

Mulier || Mull.

MULIER, in *Law*, signifies the lawful issue born in wedlock, though begotten before. The mulier is preferred to an older brother born out of matrimony; as, for instance, if a man has a son by a woman before marriage, which issue is a bastard, and afterwards marries the mother of the bastard, and they have another son, this second is mulier and lawful, and becomes heir of the father; but the other can be heir to no person. By the civil law, where a man has issue by a woman, and after that marries her, the issue is mulier.

MULL, an island of the Hebrides, the third in size, belonging to Argyleshire, and separated from the mainland by the narrow gut of sea called the Sound of Mull. It is situated in longitude 5. 18. west, and latitude 56. 27. north. Its figure is very irregular, being deeply indented by arms of the sea. Its extreme length is about thirty miles, and its greatest breadth twenty-five. The superficial area is estimated at 425 square miles. The climate is humid, and heavy falls of rain are frequent from the west, being probably caused by the high hills which form the mountainous tract in the district of Torosay; and, on the whole, this island is considered as the most boisterous of all the Hebrides. Winter, however, is much milder than on the mainland; less snow falls, and the frost is of short continuance. There are on the island several lakes, from which the brooks mostly descend. The island is for the most part rugged and mountainous, rising to upwards of 2000 feet in height; and almost every part of its shore is rocky and precipitous, exhibiting scenery which awes by its natural rudeness, as well as deep recesses and shrubby ravines, which delight the mind with their fairy beauty. Benmore, situated near the head of Loch-na-Keal, is the highest mountain, and is elevated 3097 feet above the level of the sea; it commands a view of nearly all the Hebrides, and its ascent is neither very difficult nor tedious. Bientalindh, the highest hill next to this, is 2294 feet, and also commands an extensive prospect. The island is, with slender exceptions, an entire mass of trap-rock. Limestone is found in the southern cliffs; but on the north-west side, near Inch Kenneth, a green sandstone appears; indeed Inch Kenneth is formed of it. The red granite of Mull is of admirable quality. On the northern shore of the Ross, in particular, it is distributed in such a manner, and in masses so large and free from fissures, that it would be easy to extract from it columns of twenty, thirty, forty, and even fifty feet or upwards.

Coal has been wrought in several parts of the island, but without a successful result. There are many caves in the island, but those on the western coast, in the district of Gribon, are the most remarkable. They are called Mackinnon's Cave and the Ladder Cave. The soil of Mull is both deep and fertile. The island is very bare of trees, although at one time it was celebrated for its woods. The uncommon moisture and ready drainage of the island are conducive to the production of verdure in places which might otherwise be covered with useless bog and heath. The land is therefore well fitted for grazing; and the proprietors and tenants having turned their attention to that object, have materially improved the breed of black cattle, and considerably increased their number. The Tweeddale breed of sheep has been substituted for the ancient Highland one. A few of the Cheviot race are also to be found in the low farms, but the boisterous climate has prevented their general adoption. The breed of horses is peculiar to the island, and they have been long noted for hardiness. They are now greatly reduced, in consequence of the allotment of farms, the introduction of green crops, and improvements in farming. A few are still exported to the Irish market. Mull, in consequence of the action of the sea, is not very productive of kelp, yet about 600 tons are manufactured annually. The inhabitants are naturally

Mullahpore ‖ Muller.

indolent: they follow no branch of industry; rearing cattle, agriculture, fishing, and making kelp, being their only employments.

The antiquities of Mull are uninteresting. There are a few Danish remains, and ruins of some of the ancient strongholds. The most striking of these is Castle Duart, placed at the entrance of the Sound of Mull. At Balphetrish is the famous ringing stone. Mull is divided into the three parochial districts of Kilfinichen, Kilninian, and Torosay, which also comprehends several of the adjacent islets within its pastoral cure. There are several villages in the island, but the only one of note is Tobermory, situated near the head of the Sound. It was built in 1789, by the Board of Trustees for the Encouragement of the Fisheries, and comprises an upper and lower town, the former consisting of very dingy streets; the latter is built in the form of a crescent, and contains the custom-house, an inn, a post office, and from fifty to sixty slated houses. The town has remained almost stationary since it was built, partly in consequence of the peculiar habits of the people, and partly owing to the unfavourable position of the town, and its distance from the fishing-grounds. The number of boats employed at this station in the year ending the 5th of April 1836 was 642, yielding employment, in fishing, gutting, and packing, to 4552 persons. The number of cod, and of ling or hake, brought into this port during that year, amounted to 43,090; of these, 1338 hundredweights were cured; as also 705 barrels of white herrings. The number of men and boats employed do not belong to Tobermory, but come from all quarters at the fishing season. In 1831 the inhabited houses in the island were 1817, and the families 2031. The families employed in agriculture were 1297; in trades, 284; not included in either of these classes, 450. The total number of males was 5265, and that of females 5273, making in all 10,538. The actual population of Tobermory amounts to about 1500.

MULLAHPORE, a town of Hindustan, in the nabob of Oude's territories, situated on the south-west side of the Goggrah River. Long. 81. 16. E. Lat. 27. 40. N.

MULLENBACH, a city of Hungary, in the province of the Siebenbergen, in the part distinguished as the land of the Saxons. It is the capital of a circle extending over 116 square miles, with a population of about 22,000 persons. It stands on a river of the same name, is surrounded with walls, and has two extensive suburbs. It contains a Catholic, a Greek, a Calvinist, and a Unitarian church, with 600 houses, and 4115 inhabitants, employed in agriculture and in the cultivation of vineyards. Long. 22. 30. 15. E. Lat. 45. 57. 48. N.

MULLER, or Regiomontanus, John, a celebrated astronomer of the fifteenth century, was born at Koningshoven, in Franconia, in 1436, and acquired great reputation by publishing an abridgment of Ptolemy's Almagest, which had been commenced by Purbach. He went to Rome to perfect himself in the Greek tongue, and to visit Cardinal Bassarion; but finding some faults in the Latin translation of George de Trebizond, the translator's son assassinated him in a second journey which he made to Rome in 1476, where Pope Sixtus IV. had provided for him the archbishopric of Ratisbon, and had sent for him to reform the calendar. But others state that he died of the plague.

Muller, or *Mullar*, denotes a stone flat and even at the bottom, but round at the top, being used for grinding substances on a marble. The apothecaries use mullers to prepare many of their testaceous powders; and painters for their colours, either dry or in oil.

Muller is also an instrument used by the glass-grinders, being a piece of wood, to one end of which is cemented the glass to be ground, whether convex in a bason, or concave in a sphere or bowl. The muller is commonly about six inches long, and rounded by turning; the cement used is composed of ashes and pitch.

Mullingar ‖ Mundattafal.

MULLINGAR, the county town of Westmeath, in the province of Leinster, in Ireland, is forty-eight miles from Dublin. Long. 7. 19. W. Lat. 53. 32. N. It is situated on the river Hoyle, and the Royal Canal passes by the town. It holds fairs four times a year, in which a considerable trade is carried on in cattle. The living is a vicarage in the diocese of Meath, with a church and parsonage upon a glebe of two acres, built in 1812. In the year 1227 the priory of St Mary, formerly known by the name of *The House of God of Mullingar*, was founded by Ralph de Petyt, bishop of Meath, for regular canons of the order of St Augustin. A Dominican friary was also founded here in 1237, by the family of Nugent; and some ruins of it still remain. In 1622 the friars of Multifarnham began to erect a house for friars of the order of St Francis, but it was never completed. The population of the parish in 1831 was 8869.

MULTAPPY, a town of Hindustan, in the province of Berar, sixty miles N.N.E. from Ellichpoor. Long. 78. 28. E. Lat. 22. 19. N.

MULITPLE, in *Arithmetic*, a number which comprehends some other several times. Thus 6 is a multiple of 2, and 12 is a multiple of 6, 4, and 3, comprehending the first twice, the second thrice, and the third four times.

MULTIPLICAND, the number to be multiplied by another.

MULTIPLICATION, in general, the act of increasing the number of any thing.

Multiplication is a rule by which any given number may be increased, according to any number of times proposed. See Arithmetic.

MULTIPLICATOR, or Multiplier, in *Arithmetic*, the number by which any other is multiplied, or the number of times it is supposed to be taken.

MUM, a kind of malt liquor much drunk in Germany.

MUMMIUS, Lucius, a Roman consul sent against the Achæans, whom he conquered in the year 147 before Christ. He destroyed Corinth, Thebes, and Chalcis, by order of the senate, and obtained the surname of *Achaicus*, from his victories. He did not enrich himself with the spoils of the enemy, but returned home without any increase of fortune. He was so little acquainted with the value of the paintings and works of the most celebrated artists of Greece which were found in the plunder of Corinth, that he said to those who conveyed them to Rome, that if they lost or injured them they should make others in their stead.

MUMMY, a body embalmed, or dried and preserved in the manner used by the ancient Egyptians. There are two kinds of bodies denominated *mummies*. The first are only carcasses dried by the heat of the sun, and by that means preserved from putrefaction. Some imagine that these are the bodies of deceased people buried in the desert on purpose to keep them entire without embalming; but others think they are the carcasses of travellers who have been overwhelmed by the clouds of sand raised by the hurricanes frequent in those deserts. The second kind of mummies are bodies taken out of the catacombs near Cairo, in which the Egyptians deposited their dead after embalming. See Embalming.

MUNDEN, a city of the province of Göttingen, in the kingdom of Hanover. It is situated at the junction of the rivers Fulda and Werra, which together form the Weser. It is in a most picturesque spot, and has an ancient castle and three churches, but no walls. The inhabitants are about 5000, and have considerable trade by the rivers which unite near them.

MUNDATTAFAL, a town of Hindustan, in the Mahratta territories, in the province of Khandesh, being situated on a small island formed by the Nerbuddah, sixty-five

Mundium ‖ Munich.

miles south-south-east from Oojain. Long. 76. 17. E. Lat. 22. 25. N.

MUNDINGOES, or MANDINGOES. See MANDINGO.

MUNDIUM, a village of Hindustan, in the territory of Mysore, fortified with a mud wall. Long. 77. 4. E. Lat. 12. 31. N.

MUNGULHAUT, a large manufacturing town of Hindustan, in the province of Bengal, and district of Rungpoor, twenty miles north of Rungpoor. Long. 89. 20. E. Lat. 25. 59. N.

MUNGULORE, a town of Afghanistan, in the province of Cabul, and formerly the capital of a district now decayed. Long. 71. 15. E. Lat. 34. 13. N.

MUNGULWARA, a town of Hindustan, in the province of Bejapore. It is fortified with a stone wall, has a good market, and is sixteen miles south-east from Panderpoor.

MUNDUS PATENS, the open world, in Roman antiquity, a solemnity performed in a small temple, of a round form like the world, dedicated to Dis or Pluto and the rest of the infernal gods. This temple was opened but three times in the year, viz. on the 24th of August, the 4th of October, and the 7th of November. During these days the Romans believed that hell was open, and on these days therefore they never offered battle, enlisted soldiers, put to sea, nor married.

MUNICH, a city, the capital of the kingdom of Bavaria, as well as of the circle of the Iser, in which, on the banks of the river of that name, it is situated. It is in longitude 12. 28. 25. east, and in latitude 48. 8. 20. north. It is situated on a plain nearly surrounded by the river, and is enclosed with walls, although they afford but a slight military defence. The streets are wide, and the houses well built, while some of the public edifices display a magnificence rather surpassing the extent and wealth of the kingdom. The private dwellings are for the most part large. In 1836, the population, including the military, amounted to 95,536, of whom 72,000 were Roman Catholics, 5800 Lutherans, 600 Calvinists, 900 Jews, and a few belonging to other sects. The royal palace is a magnificent pile, extending to 550 feet in length, with beautiful Doric gates and pillars. The interior, besides elegant suites of apartments, contains a beautiful chapel, in which is an altar said to have belonged to Mary Queen of Scotland during her imprisonment, the antiquarium, and the schatzkammer or treasury of the crown jewels. The picture-gallery is a noble building, well calculated for exhibiting to advantage the finest collection of works of art in Germany. It has been formed out of the galleries of Manheim, of Dusseldorf, and of Deux Ponts, with additions purchased by the late king in Italy, Vienna, and Paris. The royal library is a valuable assemblage of books, but particularly rich in numerous curious manuscripts. The antique gallery, erected by the present king when crown prince, is a most elegant edifice. It is in front 225 feet, and has a peristyle of twenty-two Ionic pillars; it is built of marble, and contains an excellent collection of ancient and modern statuary. The elegance of the exterior of this building, called the glypthothek, is very imposing. There are several other objects of curiosity which render Munich a city worth visiting. The English garden, with a rapid stream conducted through it, is well arranged, and forms a delightful promenade. The patronage of the fine arts is extensively exercised, and the societies for the encouragement of them, as well as of the useful arts, are extensive and liberal. The observatory is furnished with the best optical instruments, all fabricated by native workmen. The telescopes, whose lenses were ground by Fraunhofer, are of great celebrity, and have rarely been equalled. The manufactures, though numerous, are upon a small scale; the most remarkable being those of philosophical instruments, jewellery, gold and silver articles, musical instruments, watches, and some smaller articles. The lithographic art is carried on with more skill and success at Munich than in any other place. The churches are numerous, handsome, and well attended by a population apparently more devout than is commonly the case in Germany. The Protestants are not more than one tenth of the inhabitants. Though the city is 1900 feet above the level of the sea, and consequently cold in winter, it is generally considered as healthy.

Municipal ‖ Munster.

MUNICIPAL, in the Roman civil law, an epithet which signifies being invested with the rights and privileges of Roman citizens.

MUNICIPES, an appellation given by the Romans to the inhabitants of the *municipia* or enfranchised cities.

MUNICIPIUM, in Roman antiquity, a corporation borough, or enfranchised city or town, where the inhabitants enjoyed their own laws and customs, and at the same time were honoured with the privileges of Roman citizens. But this privilege generally extended no farther than the bare title. Some indeed, by particular merit, obtained the liberty of votes, which occasioned the distinction of *municipium sine suffragio*, and *municipium cum suffragio*. The inhabitants of the *municipium sine suffragio* were called barely *Romani*, but those of the *municipium cum suffragio* were called *Cives Romani*.

The difference between proper citizens of Rome and the inhabitants of the municipium or free town may be thus expressed. The proper citizens of Rome were registered in the census, had the right of suffrage and of bearing honours, were assessed in the poll-tax, served in the legions, used the Roman laws and religion, and were called *Quirites* and *Populus Romanus;* whereas the municipes enjoyed the first three of these privileges, but were denied the last three.

MUNITION, the provisions with which a place is furnished for defence, or that which follows a camp for its subsistence.

MUNITION *Ships* are those which have stores on board in order to supply a fleet of men-of-war at sea. In an engagement, all the munition ships and victuallers attending the fleet take their station in the rear of the others; they do not engage in the fight, but attend to such directions only as are sent to them by the admiral.

MUNKACS, a market-town of the circle of Unghvar, in the province of Hither Theiss, in Hungary. It stands on the river Latorcza, and contains a Catholic, a Calvinist, and a Unitarian church, with 730 houses, and 5008 inhabitants, who refine much common salt and saltpetre. Near to it is a celebrated fortress. Long. 22. 16. 58. E. Lat. 48. 25. 48. N.

MUNNIPORE, a town of the Burman empire, and capital of the province of Cassay. It was formerly a Hindu state, but was conquered by the Burmans in 1774, and has since that period continued tributary to them. Long. 94. 30. E. Lat. 24. 20. N.

MUNSTER, the most southern of the four provinces of Ireland, is bounded on the north by Connaught, on the east by Leinster, and on the south and west by the Atlantic Ocean. It measures 150 miles in its greatest length, from Brow-Head, the most southern point of Ireland, to Meelick, the northern extremity of Tipperary, and about the same breadth in an eastern and western direction, from Dunmore Head in Kerry to Waterford harbour, extending over a superficies of 5,879,872 acres, of which 3,929,852 are capable of cultivation, 1,905,368 are bog or unprofitable mountain land, and 44,652 are covered with standing water.

The ancient name of the province was Mumhan, in Latin Momonia. According to the older geographers, its maritime regions were peopled, commencing eastwardly, by the Brigantes, the Velabori, the Ibernii, the Lucenii, the Vodii, and the Cangani; whilst its interior was occupied by the

Munster. Scoti. At a later period it contained the eight following principalities: 1. Hy Breoghan, now the county of Waterford; 2. Osragii, afterwards Ossory, and now forming parts of the Queen's County and of Tipperary; 3. Oir-Mumhan, East Munster, now Ormond, comprehending the baronies of Ormond and of Owney and Arra in Tipperary; 4. Tuath-Mumhan, Thomond, or North Munster, now the county of Clare; 5. Aine-Cliach, or Eoganach Aine-Cliach, now Limerick; 6. Ciar or Cerrigia, now Kerry; 7. Aoibh-Liathain, containing the northern part of the county of Cork; and, 8. Corcaluighe, the southern part of the same county, and the ancient kingdom of Cork. The principal toparchs or heads of septs in those divisions, several of whom assumed the title of king, but acknowledged the supremacy of the king of Munster, were the O'Briens, the Barrys, the M'Arthys, and the O'Sullivans. After the arrival of the English, the greater part of the province became the property of the Butlers, and of different branches of the Fitzgerald family, amongst the latter of whom the Earl of Desmond long ruled the whole of its southern portion with an authority almost independent of that of the English crown. On the death of the last earl of that name, and the subsequent confiscation of his immense estates by Elizabeth in consequence of his rebellion, the greatest part of it was parcelled out amongst English adventurers, amongst whom was the celebrated Sir Walter Raleigh. The descendants of these adventurers, or "undertakers," as they were styled in the phraseology of those days, have, for the most part, melted away from observation in a manner altogether unaccountable and surprising. The province is now divided into the six counties of Clare, formerly included in Connaught, Cork, Kerry, Limerick, Tipperary, and Waterford.

According to the ecclesiastical arrangements of Ireland, Munster constituted the province of Cashel, consisting of the archbishopric of the same name, with which were united the diocese of Emly; the bishopric of Limerick, Ardfert, and Aghadoe; the bishopric of Waterford and Lismore; the bishopric of Cork and Ross; the bishopric of Cloyne; and the bishopric of Killaloe and Kilfenora. This arrangement has been lately altered by the legislature. The archbishopric of Cashel is, on the demise of the present holder thereof, to be reduced to the rank of a bishopric, subordinate to the archiepiscopal see of Dublin, and the whole province is to be consolidated into four dioceses, in the following manner: Cashel is to be holden with Emly, Waterford, and Lismore; Cloyne with Cork and Ross; Killaloe with Kilfenora, and with these are also to be united the sees of Clonfert and Kilmacduagh, hitherto forming part of the archiepiscopal province of Tuam; and Limerick with Ardfert and Aghadoe, as hitherto.

The northern parts of Munster are, generally speaking, level. Towards the south and south-west the land rises into elevations of considerable height, Macgillicuddy's Reeks, in Kerry, being the highest mountain range in Ireland. Garrantual, the most elevated of its peaks, is nearly 3500 feet above the level of the sea. The mountains in the county of Cork stretch in the direction of east and west. The lofty range of Slieve-Bloom forms the eastern boundary of the province. The river Shannon passes through its northern part, separating the county of Clare from those of Tipperary, Limerick, and Kerry. The Suir, Blackwater, Lee, and Bandon, water the southern districts. The only lakes of note are those of Killarney, in Kerry, which owe their celebrity much more to the picturesque beauties of their scenery than to the extent of their surface. The bays, creeks, headlands, and islands, which are numerous, and in most instances worthy of special notice, have been already mentioned in the general description of the island. See IRELAND.

The climate, though moist from its exposure to the prevailing south-western winds, which pass over it loaded with the humid exhalations of the Atlantic, is peculiarly mild. Munster. The severity of winter is but slightly felt even in its more elevated regions, whilst in its more level parts, along its southern shores, the myrtle blooms richly and unsheltered; and the arbutus, indigenous in Kerry, attains an unusual size. Such is the prevailing opinion of the genial temperature of the atmosphere, that an attempt was lately made to introduce the rearing of the silk-worm on a great scale, in the hope of establishing the silk manufacture on a permanent basis in this part of Ireland, by having the raw material at the mere price of its production; and though the experiment has failed as to its main object, the growth of the mulberry trees, which were planted in large numbers for the sustenance of the insect, has proved that they were not fixed in an ungenial climate.

The soil throughout the level parts is peculiarly fertile, producing abundantly rich crops of every kind of grain, and many species of fruits, which, in other parts of the island, are capable of being ripened only by means of an artificial atmosphere. The tract of land stretching across the counties of Limerick and Tipperary, from Askeaton to the limits of Kilkenny, has long been distinguished by the name of the Golden Vale, an appellation justly bestowed upon it from its singular fertility. Even in the less favoured climate of the elevated parts of Kerry, tillage has been carried upwards along the mountain sides to heights unexampled elsewhere.

As to its geological relations, the northern parts of Munster are included within the limits of the great plain of flœtz limestone, which constitutes the central formation of Ireland. The southern parts are mostly of the sandstone and clay-slate formation; the former being more developed in the mountains, the latter in the more level parts. Bog is abundant and very generally distributed, although the province lies without the great central band, which embraces most of the soil of this description. Coal is found in large quantities in the interior; but its use is much limited by the rugged character of the region within which it lies, and the consequent difficulty of carriage. There are two fields of this mineral; one, the larger, in the centre of Cork county; the other in Tipperary, where a branch of the great Leinster coal-field stretches into the province. In both places the mineral is of the carbonaceous or stone-coal species, the slate glantz-coal of Werner. Several mines of copper, lead, and iron, were worked with profit until stopped by the failure of timber for fuel; notwithstanding which a few are still carried on successfully. Mineral springs are numerous; that of Mallow, which is of the same nature with the hot wells near Bristol, maintaining a high character for its medical efficacy. Transparent crystals are frequently found in Kerry. Some caves producing stalactites have been lately discovered in the county of Cork, and the precipitous fissures in the cliffs upon the western and southern shores, where the surface soil has been washed away by the workings of the ocean, present many objects of great interest to the geologist.

The population of Munster amounted in 1821 to 1,935,612 souls, and in 1831 to 2,165,193. The peasantry are a large, athletic, and handsome race, exhibiting, in their oval faces and dark hair, strong traces of similarity with the Spaniards. Their occupation is chiefly agricultural. The raising of grain and the pasturage of cattle, which are exported in great numbers from Cork, Limerick, and Waterford, form their chief employment. The manufacture of frizes and coarse woollens, as also of coarse linen cloth for domestic consumption, is carried on very generally. Formerly the country round Carrick-on-Suir was the seat of an extensive woollen trade.

The province contains several of the largest cities in Ireland: Cork, the next in size and population to Dublin, containing a population of upwards of 100,000; Limerick,

Munster ‖ Murat.

having 65,000; and Waterford, nearly 30,000. Each of these is the seat of a good export trade, chiefly in provisions.

MUNSTER, one of the governments into which the Prussian province of Westphalia is divided. It is formed out of the ancient bishopric of that name, and several sovereignties which have been at different times secularized or mediatized, viz. Salm-Ahaus, Salm-Bocholt, Rheina-Wolbech, Horstmar, Dulmen, Steinfurt, Anhalt-Dulmen, Ghemen, and Gronau. It extends over 2228 square miles, is divided into ten circles, and comprehends thirty-eight cities or walled places, fifteen market-towns, and 732 villages, with 57,577 houses, inhabited by 382,540 individuals. It is for the most part a poor and heathy district, excepting near the rivers. It produces barley-corn equal to the consumption, but is very deficient in fuel.

MUNSTER, a city, the capital of the Prussian government of that name. It is situated on the river Aa, which, by means of a canal, communicates with the Ems. It was formerly fortified; but its walls have recently been converted into elegant promenades. It has a fine palace, and a castle near it; and the cathedral is an ancient building, surrounded by rows of trees. It contains six parish churches, one of which is Lutheran, the others Catholic. It is the seat of a Catholic bishop, and of a college formerly belonging to the Jesuits, for the education of Catholic priests. On the tower of one of the churches are affixed the three iron cages in which Knipperdoling and his companions, the leaders of the Anabaptists, were suspended, after their revolutionary movements were suppressed, in 1535. The place is remarkable for the peace of Westphalia, concluded at it, after many years of deliberation, in 1648. It now contains 1500 houses, and 18,260 inhabitants, exclusive of the military. In the town-hall is a curious collection of ancient armour, and many other antiquities. There are only some small manufactories of linen and woollen goods; but there is considerable trade in the exchange of internal commodities, especially in Rhine wine and wool, and there are several breweries. Long. 7. 31. 2. E. Lat. 51. 58. 10. N.

MUNYCHIO, an anniversary solemnity observed at Athens, in honour of Diana, on the 16th of the month Munychion. Cakes were offered on the occasion, called ἀμφιφωντες.

MUNYCHION, the tenth month of the Athenian year, containing twenty-nine days, and answering to the latter part of our March and the beginning of April. It was so called from the festival Munychia, which was observed in this month.

MURAL, something belonging to a wall, which the Latins call *murus*.

MURAL *Arch*, is a wall, or walled arch, placed exactly in the plane of the meridian, that is, upon the meridian line, for the fixing of a large quadrant, sextant, or other instrument, to observe the meridian altitudes, &c. of the heavenly bodies. Tycho Brahe was the first who used a mural arch in his observations; after him Hevelius, Mr Flamsteed, De la Hire, and others, employed the same means.

MURANO, a town of the province Calabria Citeriore, in the kingdom of Naples, on the river Coscile. It is an ill-built place, containing 4200 inhabitants, who make silk goods, and grow some excellent wine.

MURANO, a city of Italy, in the delegation and government of Venice. It is situated on a lagoon to the north of that city. It contains fifteen churches, but only 3690 inhabitants. It was formerly very celebrated for its various fabrics of glass, but these have greatly declined, and the population has also diminished. Some looking-glasses are still made. It is in latitude 45. 27. 1. N.

MURAT, JOACHIM, one of the lieutenants of Napoleon, was born on the 25th of March 1771, at La Bastide, near Cahors, where his father was an innkeeper. Being sent to school at Toulouse, he there acquired some slight degree of elementary instruction; but his taste for dissipation and adventure soon drew him away from his studies, which he appears to have entirely neglected. Having returned to the hostelry of his father, he engaged in the service of the house along with the domestics, and then enlisted in the chasseurs of the Ardennes. But, in consequence of some misconduct, he soon afterwards deserted, and having gone to Paris, fell into such distress that he was obliged to serve at the table of a restaurateur. Being remarked for his activity and bearing, and his father having resolved to send him some assistance, he was admitted into the constitutional guard of Louis XVI.; and, on the disbanding of that body, which followed soon after its formation, he obtained a sub-lieutenancy in the eleventh regiment of *chasseurs à cheval*. Here he showed himself a furious revolutionist, and in consequence obtained rapid promotion. He was already lieutenant-colonel, and one of the most fervent adherents of Marat, when, upon the death of that ferocious tribune of the people, he wrote from Abbeville, where he was then in garrison, requesting the society of the Jacobins at Paris to grant him permission to change his name into that of Marat. It is not known whether his request was positively complied with; but it is certain that, after the fall of Robespierre, he was, like Bonaparte, dismissed as a terrorist, and, like him also, found himself at Paris, nearly without resources, in expectation of some change which might prove favourable to his prospects. Nor were his hopes in this respect disappointed. Being restored to his rank at the epoch of the 13th Vendemiaire (5th October 1795), he served under the orders of Bonaparte, when the latter was employed to disperse the Parisians who had armed against the Convention. Attaching himself more and more to this young general, Murat showed much intelligence and bravery at the opening of the campaign of Italy in 1796, and became the confidential aide-de-camp of Bonaparte. In consequence of a mission to the court of Turin, which had made overtures of peace, he set out for Paris with despatches relative to the negociations; and, in the month of June, he accompanied Faypoult to Genoa, with instructions to demand of the doge the expulsion of the imperial minister. On his return to the army, Murat directed several attacks with success; and during all that campaign, and the subsequent one of 1797, he signalised himself by his bravery. In March 1798, he proceeded at the head of a column to the confines of the Valteline, and united that province to the new Cisalpine republic. He likewise preceded Bonaparte when, after the peace of Campo Formio, that general traversed Switzerland and Alsace on his way to Rastadt. Being sent to Rome with Berthier, he marched against the insurgents of Marino, Albano, and Castello, killed a great many of them, and caused to be arrested a considerable number of monks and prelates, reputed enemies of France. When the expedition to Egypt had been resolved on, he declared, that being attached by gratitude to Bonaparte, he would follow him through the world; in fact, he never quitted his chief, and throughout the whole course of that expedition distinguished himself, particularly at Mount Tabor, where, by a series of brilliant charges, he completed the dispersion of the Turkish army, and was rewarded with the rank of general of division. On his return to France with Napoleon, Murat rendered him effectual service at Saint-Cloud, when he changed the form of the government, and took possession of power. It was Murat who, at the head of sixty grenadiers, dispersed the Council of Five Hundred. He was immediately named commandant of the consular guard, and henceforth enjoyed unlimited favour. To draw still closer the ties which united them, Napo-

Murat.

Murat. leon gave Murat his sister Caroline in marriage. He also employed him as one of his lieutenants in the army of reserve, and in this capacity Murat entered Milan, occupied Piacenza, and commanded the cavalry at the battle of Marengo. In the following year he commanded the army of observation, and, along with Micheroux, signed at Foligno an armistice between the French government and the king of the Two Sicilies. He then governed, with the title of general, the Cisalpine republic, and repaired to the *Consulta* at Lyons, in virtue of which he installed the new authorities in 1802. On the 1st of January 1804, he was appointed governor of Paris, with the rank of general-in-chief, and directed the military force when Napoleon was proclaimed emperor. A few days after this event, he was elevated to the rank of marshal of the empire, and in the following year he was raised to the dignity of prince and of high admiral.

On the breaking out of hostilities with Austria in 1806, he passed the Rhine at Kehl with the reserve of cavalry, advanced into Suabia, and, at the moment of the capture of Ulm and the capitulation of Mack, pursued vigorously the Austrian corps under the orders of the Archduke Ferdinand, in their retreat through Franconia towards Bohemia. Having overtaken the corps of Werneck, he forced it to lay down its arms, and, taking the road to Vienna, entered that capital on the 11th of November. He then marched against the Russians in Moravia, and by different charges of cavalry contributed to the victory of Austerlitz. Being invested with the grand duchy of Berg, he assumed the style of a sovereign; figured in the two subsequent campaigns, particularly at the battle of Iena; made his public entry into Warsaw on the 28th of November 1807; and commanded the cavalry at the battle of Eylau, and also at that of Friedland.

In April 1808, he entered Spain at the head of a numerous army, and employed all sorts of artifices to exasperate the differences which already existed in the royal family. Having, by a mixture of intimidation and cajolery, induced them to set out for Bayonne, where Napoleon waited to receive them, he provoked an insurrection in the capital, which, though speedily extinguished, spread the flame of discontent throughout the whole of Spain, and gave the first impulse to that spirit of resistance which, encouraged and supported by Britain, ultimately effected the deliverance of the Peninsula. Being recalled from Spain, where his imprudence had proved so detrimental to the interests of his master, he was, on the 1st of August 1808, proclaimed king of the Two Sicilies, under the name of Joachim-Napoleon. As he succeeded Joseph Bonaparte, whom the Neapolitans despised, the comparison was to his advantage; whilst, by the pomp he displayed, and his martial air and bearing, he won the favour of the people, who are always ready to be caught by appearances. The invasion of Russia in 1812 recalled him under the banners of his former master. Being placed at the head of the cavalry, he took part in all the operations which preceded the capture of Moscow; he also commanded a separate corps at Kaluga, where at first he obtained some advantages, but subsequently experienced great reverses; and after the departure of Napoleon from the army, he was intrusted with the command of it in its disastrous retreat from Smorgoni. Fatigued and discontented, however, he also abandoned the army, and took the road to Naples, in the hope of yet supporting a throne which seemed destined to crumble into pieces along with the colossal fabric of the French empire. His whole subsequent conduct betrays the inherent weakness and instability of his character. On his return to his capital, he made overtures to the court of Vienna, with a view to the formation of an alliance with Austria; but the campaign of 1813 soon afterwards opened; and as the first events proved favourable to Napoleon, Murat quitted Naples, and once more repaired to the head-quarters of the French army, though with less zeal and parade than formerly, and as if constrained to appear there. After the loss of the battle of Leipzig, he withdrew to his states, and, considering the star of Napoleon as for ever eclipsed, he opened his ports to the English, and renewed the negociations for the accession of Naples to the European alliance against France. As the price of this defection, he obtained the recognition of his political existence and of his right of conquest to the city of Ancona and the pontifical marches; but his sincerity was justly doubted by the allies, whom he had joined from necessity, whilst Napoleon naturally reproached him with conduct at variance with every principle of loyalty and gratitude. Murat.

It is unnecessary to give details of his subsequent proceedings, the account of which belongs properly to the history of the country at the head of which the fortune of war and of conquest had placed him. Though brave as a lion in the field of battle, he showed himself one of the weakest of men when not in presence of the enemy. He had no moral courage. His title of king had turned his head, and he incurred the double reproach of treachery and ingratitude, without deriving the slightest advantage from his dereliction of principle. His invasion of Italy after the return of Napoleon from Elba was in every view a most headlong and irrational proceeding, inasmuch as all the chances were against him, and defeat was certain to be followed by destruction. After the failure of this absurd attempt, he lived for some time in retirement at Plaisance, a country-house near Toulon, where he first learned the tidings of the battle of Waterloo. The news of this disaster sounded as the death-knell of all his hopes. In the space of two months, he had lost his army, his fleet, part of his treasures, his crown, and even his field equipage; and now, after the second abdication of the man in whose fortune alone he could repose any hope for the future, all seemed irrecoverably lost. He escaped to the island of Corsica, where he had many partizans, and began to form new projects. An asylum was offered him in Bohemia, Moravia, or Austria, on condition of his renouncing the title of king, submitting to the laws of the country, and consenting not to quit his residence without the permission of the emperor. But having resolved to make an attempt to recover his power by effecting a landing in Italy, he sailed from Corsica on the 28th of September 1815, with seven transports, containing 250 men, and, on the 8th of October, reached the Gulf of St Euphemia, where one only of his barks had rejoined him, the rest being separated in a gale of wind. When he landed at Pizzo, he was accompanied by only thirty men, and knew not what course to follow. To wait for the other barks, or to make an attempt to raise the country, seemed equally dangerous. He at length decided in favour of the latter course; but all his efforts were vain. The inhabitants flew to arms, and attacked his troop, upon which the two small vessels immediately stood out to sea. Murat attempted to launch a fishing-boat which he found upon the beach; but the task exceeded his strength, and escape was impossible. Having been made prisoner, he was lodged in the castle of Pizzo, tried by a military commission, condemned, and sentenced to be shot. The judgment of the court was carried into execution on the 13th of October, when this singular man, whom death had spared in a hundred battles, fell ingloriously in an obscure town of Calabria, the victim of his own folly and ambition. He appears to have died in a manner worthy of his reputation for courage. He refused to allow his eyes to be bandaged, saw the arms charged, placed himself so as to receive the concentrated fire of the soldiers, and, exclaiming "Sauvez le visage, visez au cœur," instantly fell dead under the discharge. Murat perished in the forty-eighth year of his age, after

Murat || Muratori.

having experienced every variety of fortune; indeed he was a man whose destiny may, in some respects, be considered as the most extraordinary in modern times. Sprung from the lowest class of society, and raised to supreme rank, his elevation was the more surprising that he had neither the great qualities nor the great vices which seem to command events. Fortune had so blinded him, that he neither perceived the inevitable dangers with which the fall of Bonaparte and the restoration of the Bourbons had surrounded him, nor could he turn to account the resources which circumstances still placed in his power. (A.)

MURAT, an arrondissement of the department of Cantal, in France, 313 square miles in extent. It is divided into three cantons, and subdivided into thirty-two communes, containing 35,801 inhabitants. The capital, a city of the same name, stands at the foot of the mountain Cantal, on the river Alagnon. In the year 1836 it contained 2503 inhabitants, who are chiefly employed as coppersmiths, but also make some thread lace.

MURATORI, LOUIS ANTONY, a learned Italian scholar and antiquary, was born at Vignola, in the duchy of Modena, on the 21st of October 1672. He received his elementary education at the college of Modena, where he signalized himself by his application, and the rapidity of his progress in the ancient languages and in literature. He then entered the university, where he passed through the ordinary curriculum, applying himself with equal ardour to the study of philosophy, jurisprudence, and theology. Father Bacchini, the learned librarian of the Duke of Modena, inspired him with a taste for historical researches, and taught him to read manuscripts; and so much did he profit by his advantages, that, at the age of twenty, he was considered as a prodigy of talent and erudition. In 1694 he was called to Milan by Count Carlo Borromeo, who had appointed him a keeper of the Ambrosian Library. But before quitting Modena, he wished to take his degree of doctor *in utroque jure;* and the theses which he maintained on this occasion were universally applauded. Having established himself at Milan, and taken sacred orders, Muratori entered upon a course of study and research calculated to justify the hopes which his talents had inspired; and having made a selection from the numerous manuscripts intrusted to his care, he published them with dissertations, intended to throw light upon various disputed points in archæology. The reputation he thus acquired was great, and the Duke of Modena, regretting that he had parted with a man who seemed destined to attain such distinction, offered him, as an inducement to return, the situation of conservator of the public archives of the duchy, together with that of keeper of his library, vacant by the resignation of Father Bacchini. Muratori returned in 1700 to Modena, which he never quitted, except to visit the public collections of the principal cities of Italy. In 1734 Apostolo Zeno offered him the chair of belles-lettres in the university of Padua; but Muratori declined accepting a situation which would have withdrawn him from his favourite pursuits. The publication of a number of valuable tracts on the history of Italy during the middle ages, besides various learned dissertations, added every year to his growing reputation; and this indefatigable writer also found leisure to cultivate polite literature, nay, even to take part in the theological discussions which then occupied so much of the public attention. Indeed all the journals and all the literary collections of the time were enriched with some of his productions, the constant aim of which was utility. The complaisance with which he communicated the result of his researches had put him in communication with the most distinguished scholars of Italy, France, and Germany, who had recourse to him on all subjects of difficulty; literary societies vied with one another in sending him diplomas of admission; and many who had attained eminence in different departments of literature paid him the homage of inscribing to him their works. But, amidst all these flattering distinctions, he was sometimes the object of injurious criticisms, and on one occasion found himself called upon to repel unjust accusations. A rumour having been circulated that Benedict XIV. had discovered, in the works of Muratori, propositions contrary to the truths of religion, and that the supreme pontiff had specified these in a brief directed to the inquisitor-general of Spain, the learned librarian, confident of his innocence, addressed a letter to the pope full of respect and submission, in which he at once explained his disquietude, and repudiated the imputation cast upon his writings. The sovereign pontiff lost no time in setting his mind at ease, by explaining to him the cause of the rumour which had been circulated. His holiness declared that he had seen nothing reprehensible in his works, except certain passages concerning temporal jurisdiction; but that he had never had the intention of causing them to be formally censured, persuaded that a man of honour should not be annoyed on the pretext that he had erred in matters which have no relation either to doctrine or to discipline. The health of Muratori, enfeebled by excessive labour, at length declined, and having by the advice of his physicians discontinued his occupations, he went to breathe the air of the country. On his return he hastened to complete some writings which he proposed to publish; but the unfavourable symptoms which had previously excited the apprehensions of his friends soon reappeared in a more dangerous form, and, after languishing for some months, he died on the 23d of January 1750, at the age of seventy-seven. He was buried with much pomp in the church of Santa Maria di Pomposa, whence his remains were, in the year 1774, transported to that of Saint Augustin. Muratori never possessed any other benefice than that of Santa Maria, which, though exceedingly small, appears to have satisfied all his wishes.

Muratori.

Of the works of Muratori, sixty-four in number, a detailed list will be found in the *Biblioteca Modenese* of Tiraboschi (tom. iii. pp. 326–346). The principal are, 1. Anecdota ex Ambrosianæ Bibliothecæ codicibus nunc primum eruta, notis et dissertationibus illustrata, Milan, 1697, 1698, Padua, 1713, in two vols. 4to; 2. Vita e Rime di Maggi, Milan, 1700; 3. Della Perfetta Poesia Italiana, Modena, 1706, in two vols. 4to; 4. Anecdota Græca ex manuscriptis codicibus eruta, Latine donata, notis et disquisitionibus aucta, Padua, 1709, in 4to; 5. De Ingeniorum Moderatione in Religionis negotio, Paris, 1714, in 4to; 6. Delle Antichità Estensi ed Italiane, Modena, 1717, in two vols. folio; 7. Rerum Italicarum Scriptores præcipui ab anno 500 ad 1500, quorum potissima pars nunc prodiit, Milan, 1723–1751, in twenty-nine vols. folio; 8. Delle forze dell' Intendimento Umano, Venice, 1735 and 1745, in 8vo; 9. De Paradiso Regnique Cœlestis gloria liber, Verona, 1738, in 4to; 10. Antiquitates Italicæ medii œvi, sive Dissertationes de moribus Italici Populi ab inclinatione Romani imperii usque ad annum 1500, Milan, 1738–1743, in six vols. folio; 11. Novus Thesaurus Veterum Inscriptionum in præcipuis earundem Collectionibus hactenus prætermissarum, Milan, 1739–1742, in six vols. folio; 12. De Superstitione vitanda adversus Votum Sanguinarium pro immaculata Deiparæ conceptione, Venice, 1740 and 1742, in 4to; 13. Cristianesimo felice nelle missioni del Paraguai, Venice, 1743, in 4to; 14. Annali d'Italia dall' era volgare sino all' anno 1749, Venice, 1744–1749, in twelve vols. 4to; 15. Liturgia Romana Vetus tria Sacramentaria complectens, Venice, 1748, in two vols. folio; 16. Della Publica Felicità oggetto de' buoni principi, Lucca, 1749; 17. Lives of Segneri, Ligonius, Orsi, Tassoni, and others; 18. Dissertations, in various collections; 19. Letters, Venice, 1783, in two vols., preceded by a life of Muratori from the pen of Lazzari, professor of eloquence in the Academy

Murcia. of Pesaro. The *Works* of Muratori have been published at Arezzo, 1769–1780, in thirty-six vols. 4to; and at Venice, 1790–1810, in forty-eight vols. 8vo. (A.)

MURCIA, one of the provinces into which Spain is divided, and usually, on account of its ancient independence, denominated a kingdom. Its extent is 5931 square miles, and its population at the last census was calculated to amount to 490,000. It is bounded on the north by Valencia, on the east by the Mediterranean Sea, on the south by Granada, and on the west by New Castille. It produces wheat and barley, but not in quantities sufficient to feed its population. It has abundance of cattle on its pastures. Its rivers and coasts are well stored with every kind of fish, and it produces the most delicious fruits. It has more of the articles of commerce to spare than are required to barter in exchange for corn. It produces wines, oil, silk, hemp, barilla, kelp, and esparto, which are sent in considerable quantities to the other provinces of the Peninsula, or to foreign ports. The mountainous parts of the district are covered with trees, which furnish the different kinds of timber fit for ship-building, and for constructions on shore. In a very considerable part to the south, called El Campo, the evil of excessive drought is often experienced. In the whole of Murcia, indeed, in ordinary years, there is a scarcity of rain, which induces the cultivation of kelp and barilla, for which a very small portion of moisture is requisite. In those years in which the showers are copious, the produce of the fields is most profuse, and then the grain sown has been known to yield an increase of a hundred for one.

The principal river, and that to which Murcia is indebted for its fertility, is the Segura, which in the first part of its course crosses the sterile and rocky district of Catasparra, and then receiving the stream of the Munda, fertilizes the fruit-gardens and orange-groves of Hellin. It then passes through the delicious valley of Ricoti, which is a continued garden of oranges, lemons, citrons, pomegranates, and other fruits, the abundant crops of which exceed those of every other part of Spain. The natural productions of this province are a species of fine red earth, without any mixture of sand, which is used to polish crystals, and is mixed with the snuff in the royal manufactories. There is a large lake of salt water in the north-east part of Murcia, from which salt is refined for the use of the province. There are some very extensive manufactories of silk, though not sufficient to consume the whole quantity which the worms of the province yield. The hemp and flax grown are converted within the province into cordage and sail-cloth. Murcia has not much foreign commerce; the little which it has being carried on either by the vessels of other nations, or by those of the neighbouring provinces, particularly of Catalonia.

Though all Spanish writers describe Murcia as a most luxuriant and delightful country, their descriptions must be received with considerable abatement. Near the river Segura their representations are accurate; but when advancing on either side beyond its influence, the country presents a barren and almost uninhabited tract of land up to the mountains, scarcely a tree being anywhere to be seen. The climate is mild and warm, and, like the whole coast of the Mediterranean, has been frequently visited with epidemic fevers, which have thinned the population.

MURCIA, a city in Spain, the capital of the province or kingdom of the same name. It is an inland place, and has the muddy but fertilizing river Segura passing through it. Near the city the Segura takes a turn to the north, and then to the eastward, in its way to the sea, thus enclosing a rich plain on whose produce the prosperity of the city depends. Though Murcia is on elevated ground, being 450 feet above the level of the sea, yet it is by no means free from agues, which are supposed to be brought on by the miasmata from the marshes. The city contains a population of 34,000 souls, who depend principally on the agriculture of the surrounding province, though the manufactories of silk afford employment and yield subsistence to a considerable portion of them. It is the see of a bishop, who has a splendid palace. The cathedral is a massive pile of building, and the steeple lofty, commanding an extensive prospect over a luxuriant country. The ascent to the top, like that of some other towers in Spain, is not by steps, but by an inclined plane winding round it, which allows the visitor, if disposed, to ascend on horseback to the top. In this church are preserved, without any remorse or reprobation, the names of the different Jews who have been executed here by the Inquisition. These are inscribed on banners, and hung up as trophies, as if the exercise of inhumanity were honourable to religion. Some other buildings deserve notice. The seminary of St Fulgentius, destined to prepare youth for the ecclesiastical profession, is a pile of considerable magnitude, and of some taste; but the most striking is the edifice belonging to the *gremios mayores* of Madrid, which is filled with very ingenious machinery for throwing, spinning, and dyeing the silk. The most important of all the works of man are, however, the numerous canals cut from the river, by which its fertilizing waters are distributed to the gardens and plantations surrounding the city. It contains two colleges and two open libraries. It is situated in lat. 37. 58. 42. N.

Murcia ‖ Murkutchoe.

MURCIA, the Pagan goddess of idleness. The name is taken from *murcus*, or *murcidus*, an obsolete word, signifying a dull, slothful, or lazy person. The statues of this goddess were always covered with dust and moss, to express idleness and negligence. She had a temple at Rome, at the foot of the Aventine Mount.

MURDER, or MURTHER, the act of killing another with violence and injustice. The word comes from the Saxon *morth*, death, or, according to some persons, a violent death; and hence the barbarous Latin *murdrum* and *modrum*.

MURDERERS, or *Murdering Pieces*, in a ship, are certain small pieces of ordnance, either of brass or iron, which have chambers put in at their breeches. They are used at the bulk-heads of the forecastle, half-deck, or steerage, in order to clear the deck upon the ship's being boarded by an enemy.

MURENGERS, two officers of great antiquity in the city of Chester, annually chosen from the aldermen, to see the walls kept in repair, and to receive a certain toll for the purpose.

MURET, an arrondissement in the department of the Upper Garonne, in France, and 588 square miles in extent. It comprises nine cantons, divided into 129 communes, and peopled by 88,994 inhabitants. The capital is the city of the same name on the left bank of the Garonne. It contains 3970 inhabitants, who carry on the trades of woollen weavers, potters, and tanners. Long. 1. 20. E. Lat. 43. 30. N.

MURGHAUB, a village of Persia, in the province of Irak, on the road from Shiraz to Yezdikhast. Near it is a remarkable pillar called Tuckt Soliman, apparently of as great antiquity as the city of Persepolis. Fraser mentions, that the fort of Murghaub, a place of little strength, and surrounded by hills, is the chief village of this district. There is also a considerable river of the same name on the frontier of Khorassan, forming the boundary between it and Independent Tartary. It rises in the mountains of Goor, and is generally thought to join the Oxus.

MURICHOM, a village of Northern Hindustan, consisting of only twenty-four houses, which are of a superior structure to any in the country, and several stories in height. Long. 89. 28. E. Lat. 27. 6. N.

MURKUTCHOE, a town of Hindustan, in the pro-

Muro ‖ Murray.

vince of Bahar, ninety miles south by east from Patna. Long. 85. 45. E. Lat. 24. 23. N.

MURO, a city, the seat of a bishop, in the province of Basilicata, in the kingdom of Naples. It contains a castle, a cathedral, four parochial and three conventual churches, and 5100 inhabitants.

MUROM, a circle of the Russian province of Wladimir, extending from 41. 25. to 42. 33. east longitude, and from 55. 15. to 56. 10. north latitude. The chief place is the city of the same name, 640 miles from St Petersburg, on the river Muromka. It is an ancient city, formerly the residence of the Russian princes, and at present contains eighteen churches, three monasteries, and about 1000 houses. It is chiefly built of wood, and contains 6500 inhabitants, who carry on much trade in leather and tallow on the Wolga. Long. 38. 45. E. Lat. 53. 33. N.

MURRAY, ALEXANDER, a distinguished orientalist, was born at a place called Dunkitterick, in the county of Galloway, on the 22d of October 1775. His father, Robert Murray, had been a shepherd all his days, and his mother, Mary Cochrane, was the daughter of a person in the same humble condition of life. From the circumstances of his parents, therefore, it may be inferred that their means of educating their offspring were extremely limited; indeed it appears that the subject of this notice was in a great measure self-taught, having learned the alphabet by copying the printed letters, and thus acquired simultaneously the elements both of reading and writing. In 1784, he was put to school at New Galloway, where he made rapid proficiency; but in a short time he was seized with an illness which obliged him to leave school, and he saw no more of it for four years. He continued, however, to pursue irregularly the process of self-tuition, devouring everything that came in his way, including ballads and penny histories; and, in the course of the year 1788, he was engaged by the heads of two families in the parish of Kirkowen to teach their children to read and write, an employment which he rendered subservient to his own improvement. He afterwards went to school at the village of Minigaff, where he extended his acquisitions, chiefly by his own indefatigable exertions, learned a little French, and in a short time mastered the rudiments of Latin. He compared French and Latin, and by this practice he riveted in his memory the words of both languages. His reading now became extremely various; but he confesses that, although he certainly knew "a great deal of words and matters," his prosody was bad, and his English neither fluent nor elegant. Indulging uncontrolled his appetite for knowledge, accuracy was scarcely to be expected; he always strove to seize the sense, yet did not weary himself by analysing every sentence he read; and thus he ranged through a multitude of authors, sufficient, if carefully studied, to have occupied a considerable portion of a lifetime. To such a knowledge of Latin as might be acquired in this desultory manner, he added a smattering of Greek, and at length set about learning Hebrew, the alphabet of which he already knew. He also amused himself with writing songs and pieces of poetry, some of which, particularly a ballad, "excited more admiration than it really merited." After several years spent in the same course of vigorous but irregular application, he came to Edinburgh, where he was kindly received by Dr Baird, to whom he had brought a letter of introduction. On the day after his arrival in town, he underwent an examination in the presence of Dr Baird, Dr Finlayson, and Dr Moodie, and, on this occasion, read and explained a passage of a French author, an ode of Horace, a page of the Iliad, and a Hebrew psalm. His uncommon acquirements excited admiration, and not only procured him the direct advantages of academical instruction, but likewise obtained for him such pecuniary aid as seemed necessary for the prosecution of his studies. At the end of two years he obtained a bursary from the town; and about the same time he engaged in private teaching, which he looked to as a chief source of support. His views being directed to the church, he of course applied himself to those particular studies which are prescribed to candidates for the sacred office; but, whilst thus occupied, he devoted every leisure moment to the prosecution of his favourite studies, investigating every language to which he had access, and not only making himself acquainted with the dialects of Europe, but even extending his researches into the languages of Asia, particularly Sanscrit. Nor was his attention confined to words merely. He studied antiquities, and the philosophy of grammar. Conceiving it to be impossible to investigate the history of any one language without a competent knowledge of all the idioms directly or collaterally connected with it, he sought to discover the source and elements of all the modern dialects of Europe by an analytical examination of the languages which had prevailed in that quarter of the globe, and thus attempted to throw light on the origin, early history, and affiliation of the various nations by which it is inhabited. "I have been gratified," says he, "to find, what has often been vaguely asserted, that the Greek and Latin are only dialects of a language much more simple, elegant, and ancient, which forms the basis of almost all the tongues of Europe, and, as I hope to demonstrate on some future occasion, of Sanskrit itself."

Murray.

At this time Murray was not known beyond the circle of a few select friends, by far the most eminent of whom was John Leyden, a man of the same age, and of congenial habits and pursuits. Indeed there was no one in Edinburgh with whom Murray felt so much afraid to contend in languages and philosophy as Leyden; and it is not a little remarkable, that the latter was heard to express a similar apprehension of Murray. Leyden, who had already a high reputation, closed his bright and brief career in the island of Java, where he died of fever in August 1811. Murray had yet to lay the foundation of his renown, and an opportunity was ere long afforded him of bringing his great and various acquirements into public notice. Having been for some time an occasional contributor to the Scots Magazine, he was at length appointed editor of that work, and had also an opportunity afforded him of contributing several articles to the Edinburgh Review. He was engaged by Mr Constable to superintend a new impression of Bruce's *Travels to discover the Source of the Nile;* an undertaking for which his previous acquisitions had singularly qualified him, inasmuch as he not only understood Abyssinian, but had even mastered the two principal dialects of that language as actually spoken in the country. He commenced his labours in September 1802, and the work appeared in July 1805. During this interval, he resided chiefly at Kinnaird House, where he had access to Bruce's papers and manuscripts, and devoted himself with unremitting assiduity to the completion of his task. This edition, consisting of seven large octavo volumes, was enriched by Murray with a life of the traveller, together with notes and an appendix containing curious and learned discussions on philology, antiquities, and a variety of other subjects illustrative of the author's narrative. In the meanwhile Murray had been licensed as a preacher, though without any prospect of obtaining a living in the church. But having been strongly recommended to Dr James Muirhead, minister of Urr, who wished to have an assistant and successor, he was appointed to this charge in 1806, and, on the death of Dr Muirhead two years afterwards, became minister of the parish. In 1808, he published separately his Life of Bruce; and, in 1811, he was applied to, at the suggestion of Mr Salt, to translate a letter in Geez, from the governor Tygré to the king of

Murray. Great Britain, a task which he performed in a very satisfactory manner. He continued to perform his clerical duties and prosecute his literary researches till 1812, when, the professorship of oriental languages in the University of Edinburgh having become vacant by the death of Dr Moodie, he was proposed as a candidate for the chair, and, after a keen contest, elected by a majority of two votes. The other candidates were Dr Alexander Brunton, Dr David Dickson, and Dr David Scot. In consequence of this appointment, he removed to Edinburgh in November 1811, and immediately entered on the duties of his class, for the use of which he had published *Outlines of Oriental Philology*, a small work, containing a meagre epitome of the grammatical principles of the Hebrew language and its cognate dialects. His class was attended not only by theological students, of whom some knowledge of Hebrew is required, or at least expected, but also by several literary men, who were anxious to cultivate or renew an acquaintance with that ancient language under the guidance of so celebrated an orientalist. Dr Murray, however, was not destined long to enjoy his preferment. His constitution was not robust, and a pulmonary complaint, with which he had previously been affected, becoming aggravated by the exertion required in preparing his academical lectures, at length assumed a dangerous character, and, on the 15th of April 1813, terminated his existence, in the thirty-seventh year of his age.

Dr Murray was an estimable, and, in several respects, a remarkable man. Born in a humble station, he had been indebted for his advancement in life not less to the strict propriety of his conduct than to the extent and variety of his literary attainments. Being in a great measure self-taught, especially in early life, he had ranged through a vast field, without perhaps being thoroughly master of any subject, and had become more remarkable for the diversity than the accuracy or precision of his acquisitions. If he had been spared, he would no doubt have rectified the defects inseparable from such a desultory course of application, and narrowed the sphere of his labours, in order to proceed with greater certainty of ultimate success; but it cannot be doubted, by persons conversant with philology in its more improved and scientific form, that he often mistook fanciful speculation for inductive reasoning, and erected premature generalizations upon the uncertain basis of an arbitrary analysis.

Dr Murray left behind him in manuscript a work entitled *History of the European Languages, or Researches into the Affinities of the Teutonic, Greek, Celtic, Sclavonic, and Indian Nations*, which was published in 1823, in two vols. 8vo, under the auspices of Sir Henry Moncrieff, who enriched it with a life of the author, whilst Dr Scot of Corstorphine performed the duties of editor, and contributed a preface. The task undertaken in this work is truly gigantic, and, in prosecuting it, the author labours to prove, or rather states as the result of his researches, that all the languages of Europe may be traced to a single radical dialect; and that this dialect, again, may be analytically resolved into a few monosyllables, nine in number, some of which, according to the author, may even be considered as variations of the others; indeed he is of opinion that *ag* and *wag* were probably the first articulate sounds. Now this, to say the least, is a very bold generalization; and, if it were inductively deduced from a rigid analysis of all the languages which the author attempts to resolve into nine monosyllabic elements, it would unquestionably be a more wonderful triumph of human ingenuity than even the discovery of an alphabet. But it is impossible not to feel that such an analysis is completely beyond the reach of any single mind, even supposing its practicability, abstractedly considered, were admitted; and, on the other hand, in following the author through what he considers as his inductive method of reasoning, it is equally difficult to avoid the conviction, which is forced upon us at every step, that his assumptions are gratuitous, his deductions fanciful, and his results altogether hypothetical and imaginary. In inductive reasoning analysis precedes and ministers to synthesis, furnishing those elements which, by composition, may be arranged into something that is distinct and demonstrable. But it cannot for a moment be maintained that this may be truly predicated of Dr Murray's investigations. His results, even if they were true, are such as admit of no general conclusion being deduced from them, because it is impossible, by any known process of reasoning, to produce synthetically out of his nine elementary monosyllables any definite or recognised form of human speech; and, by the known laws of permutation, it may be proved that the rudest and the poorest dialect ever found amongst mankind could not, by any process of art or ingenuity, be generated out of such elements. So far, therefore, is "Dr Murray's system" from being "demonstrated truth," or even "looking very like it," as his editor has fondly imagined, that it appears to be equally absurd, fanciful, and visionary,—a sort of solemn, though of course unintentional, burlesque on the extravagancies of etymologists; and, independently of all other considerations, it is liable to this insuperable objection, that it proceeds upon an assumption of identity amongst languages which differ entirely in their grammatical structure and composition, as well as in their vocabularies, and which have nothing in common except some few terms which have been interchanged in the course of war, conquest, and commercial relations. A posthumous work, however, ought not to be judged too severely; and it may readily be believed that, if the author had lived to prepare it definitively for the press, he would have seen cause, as his views enlarged, to modify and improve much that now appears exaggerated or defective, and to impart to his system that method and unity which are altogether indispensable in such investigations. (A.) Murray.

Murray, *William*, Earl of Mansfield, a celebrated English lawyer, was the fourth son of David earl of Stormont, and born at Perth on the 2d of March 1705. At the age of three years he was carried to England for his education, and at fourteen admitted a king's scholar at Westminster School. At this seminary he evinced a taste for poetry, and excelled in declamation and other exercises. In June 1723, he was entered of Christ-Church College, Oxford, where he took the degree of bachelor of arts in 1727, and that of master in 1730. Having completed his academical studies, he made a tour on the Continent, and on his return became a member of Lincoln's Inn. Being called to the bar, Mr Murray early acquired reputation and obtained practice in his profession. This was, no doubt, partly owing to his talent for public speaking, in which he was allowed to excel both old and young; but there is evident injustice in the impression created by his success, that he was more of a speaker than a lawyer, and that a decided talent for oratory implies a species of disqualification for legal research. At the same time his attachment to literature, and his intercourse with Pope and other wits of the day, gave countenance to the idea that he loved poetry better than plodding, and cultivated letters when he should have been immersed in the depths of legal study. But time and experience, as they developed his powers and matured his faculties, disabused the world of this most erroneous impression, and showed that his mind was equally formed for cultivating jurisprudence, and for excelling in oratory.

As early as 1736, we find him professionally employed against the bill of pains and penalties which afterwards passed into a law against the city of Edinburgh on account of the riotous murder of Captain Porteous. In 1738, he

Murray. married Elizabeth, daughter of the Earl of Winchilsea; and in 1742 he was appointed solicitor-general, and chosen representative of Boroughbridge, for which place he was afterwards returned in 1747, and again in 1754. In 1748, he acted as one of the managers for the impeachment of Lord Lovat by the Commons, and, in his observations on the evidence, in reply to the prisoner, displayed so much candour and ability that he was complimented by the accused no less than by the Lord Chancellor Talbot, who presided at the trial. In 1753, a most injurious attack was made upon his character as a public man. It had been alleged that Dr Johnson, a person then thought of for preferment, and an intimate friend of Murray, was of Jacobitical principles, and had some twenty years before drank the pretender's health in a public company. Mr Pelham, then minister, considered the story as of sufficient importance to deserve investigation, and accordingly wrote to the author of it, Fawcett, the recorder of Newcastle, to learn the truth. Fawcett returned an evasive answer to the inquiry, but afterwards stated, in a conversation with Lord Ravensworth, that Mr Murray, and Mr Stone, a gentleman holding an office about the prince, had done so several times. Lord Ravensworth, thinking the statement of Fawcett not to be slighted, as impeaching the loyalty and principles of persons in official stations, made it the subject of such frequent remark in conversation that the ministry took it up, and advised the king to have the whole matter examined. His majesty acquiesced, and, after some proceedings in the council, a committee of the House of Lords was appointed to investigate the affair. When Mr Murray heard of this, he sent a message to the king, humbly acquainting his majesty, that if called before such a tribunal upon so trivial and scandalous a matter, he would resign his office, and decline to answer any questions. In the beginning of 1753, however, it was brought before the Lords upon the motion of the Duke of Bedford; but although the House divided it was not told, and thus ended an affair which, according to Doddington, was "the worst judged, the worst executed, and the worst supported point he ever saw of such expectation."

In 1754, Mr Murray was appointed attorney-general in the room of Sir Dudley Ryder; and, in 1756, he succeeded the same person as chief justice of the King's Bench. He took his seat on the bench on the 11th of November, and was immediately afterwards raised to the peerage by the title of Baron Mansfield, to himself and to the heirs male of his body. His first care was to introduce regularity, punctuality, and despatch in carrying through the business of the court; his next, to prevent delay and expenses in the disposal of causes where the court entertained no doubt. These and other reforms equally necessary gave general satisfaction, and the business of the court increased to an extent never before known, yet continued to be despatched with exemplary regularity. It is stated by Sir James Burrow, in the preface to his Reports, that at the sitting for London and Middlesex, there were as many as eight hundred causes set down in a year, "and all disposed of." In consequence of method, and a few distinct rules laid down to prevent delay, even where the parties themselves would have willingly consented to it, the business *in banco*, notwithstanding its immensity, was carried through with equal despatch, nothing being allowed to hang in court or accumulate, and upon the last day of term there was rarely a single matter of any kind that remained undetermined. It appears, indeed, that excepting in the case of Perrin and Blake, and in that relating to literary property, there had not been a final difference of opinion in the court upon any point whatsoever, from the 6th of November 1756 to the 26th of May 1776; and it is not less remarkable that, excepting these two cases, no judgment given during this period had been reversed either in the exchequer chamber or in parliament, whilst, even in respect to these reversals, great difference of opinion existed amongst the judges. Murray.

During the very unsettled state of the ministry in 1757, Lord Mansfield accepted the office of chancellor of the exchequer, and was the means of effecting a coalition of parties, out of which was formed a strong and successful administration. In the same year he was offered the great seal, on the retirement of Lord Hardwicke, but declined it. At the commencement of the reign of George III., he was marked out as an object of party rancour, and continued for many years exposed to violent and unsparing invective, the most vigorous specimens of which have come down to us in the Letters of Junius. But the virulence of party libels occasioned no interruption in the attention which he uniformly paid to the business of his court. During the Rockingham administration, in 1765, he opposed the bill for repealing the stamp act, and is believed to have had some share in framing the protests recorded against it, although he did not sign them. The affair of Mr Wilkes' outlawry served to rekindle the animosity with which he had been regarded by the popular party, and exposed him to renewed attacks. The question, whether this outlawry should be reversed or not, was a dry point of law, upon the wording of the record, and nothing could possibly be more remote from considerations of expediency or reasons of a political character. Yet, though merely a matter of special pleading, it was rendered an occasion of much popular excitement; and upon the day when judgment was to be given, not only the court, but the whole of Westminster Hall and Palace Yard, were crowded with anxious spectators. The court had made up their minds to reverse the outlawry, and thus place Mr Wilkes in a situation to receive judgment on the conviction. Upon this occasion, Lord Mansfield took notice of the popular excitement which had been directed against the judges of the court, particularly himself; he declared his contempt for all the threats which had been employed to deter the court from doing their duty; and he described such attempts as calculated to have no effect at all, or only one contrary to that which they were intended to produce, though he believed and knew that he had fortitude enough to resist even that weakness. "No libels, no threats, nothing that has happened, nothing that can happen," said he, "will weigh a feather against allowing the defendant, on this and every other question, not only the whole advantage he is entitled to from substantial law and justice, but every benefit from the most critical nicety of form, which any other defendant could claim under the like objection. The only effect I feel," he adds, "is an anxiety to be able to explain the grounds upon which we proceed, so as to satisfy all mankind, that a flaw of form, given way to in this case, could not have been got over in any other." Upon the same occasion he gave expression to a very striking sentiment. "I honour the king," said he, "and respect the people; but many things acquired by the favour of either are, in my account, objects not worth ambition. I wish popularity; but it is that popularity which follows, not that which is run after."

In the beginning of 1770 Lord Mansfield was once more offered the great seal, which he again declined; and a similar offer, renewed the following year, found him equally inflexible. About the same time he was attacked, in both houses of parliament, on account of his direction to the jury in the case of Woodfall the printer, who had been prosecuted for a libel. But as his lordship's doctrine, however dangerous in point of general principle, seemed to be correctly deduced from preceding decisions, and in accordance with the law as it then stood, and as the whole court concurred in sanctioning it, his opinion stood its ground, notwithstanding the powerful arguments with which it had been assailed. The direction which he gave to the jury was, in

Murray. effect, that the question of law belonged exclusively to the court, and that the only point competent for the jury to try was merely the fact of publication, leaving it to the judges afterwards to decide whether the matter published did or did not amount to a libel. In 1776 his lordship was raised to the dignity of earl, with remainder to Louisa Viscountess Stormont, and to her heirs male by David Viscount Stormont her husband.

In June 1780, when the metropolis of the kingdom was, for several days, exposed to all the fury of lawless banditti, which took advantage of the tumultuous assemblages brought together by the Protestant Association, Lord Mansfield was marked out as an object of popular vengeance, and his house in Bloomsbury Square, with every thing it contained, including his library and manuscripts, was burned to the ground. This occurred on the night of Tuesday the 7th of June; and he did not appear in court until the 14th, which was the last day of term. When he took his seat on the bench, a reverential silence prevailed, expressive of sentiments of condolence and respect more affecting than the most eloquent address which the occasion could have suggested. His lordship submitted to his loss with calmness and dignity. At one moment, however, his feelings almost overpowered him. Having entered the House of Lords whilst the capital was still in the hands of the mob, now maddened by intoxication, and being loudly called for as soon as he had taken his seat, he rose and said, "My Lords, on the present occasion I shall not express my opinion from books; God knows, I have none." This touch of natural eloquence, delivered with suppressed emotion, had a powerful effect on the house. His lordship was entitled, amongst others, to recover the amount of his loss from the hundred, but he preferred no claim of compensation. Further, in consequence of a vote of the House of Commons, the treasury directed the surveyor of the Board of Works to apply to Lord Mansfield, as one of the principal sufferers, requesting him to specify the nature and amount of his loss; but he declined the proposed indemnification. "It does not become me," said he, "however great the loss may be, to claim or expect reparation from the state."

From this time it seemed as if popular hatred had spent its force. Party animosity appeared to be mitigated by the dignity with which he bore his heavy loss; and, during the remainder of his life, all parties united in a common feeling of respect and reverence for his character and virtues. Notwithstanding his advanced age, he continued until 1787 to discharge his judicial functions with his wonted regularity; but from that time his infirmities increased so rapidly, that, in June 1788, he came to the resolution of resigning his office, and withdrawing into the shade of retirement. On this occasion the gentlemen who practised in the court where his lordship had so long presided, addressed to him an eloquent letter expressive of their admiration and regret, and at the same time consoling themselves with the reflection that his lordship was not cut off by the sudden stroke of a painful distemper, or incapacitated by the ebb of those extraordinary faculties which had so long distinguished him, but that it had pleased God to allow to the evening of an useful and illustrious life the unclouded reflections of a superior and unfading mind over its varied events, and the happy consciousness that it had been faithfully and eminently devoted to the highest duties of human society. This letter was drawn up and transmitted to the venerable judge, by Mr, afterwards Lord Erskine, and elicited a reply, in which he declared, that if he had given any satisfaction, it was owing to the learning and candour of the bar, the liberality and integrity of whose practice freed from difficulty the judicial investigation of truth, and facilitated the administration of justice. His health continued to decline, but his mental faculties remained unimpaired almost to the last. He was happy to receive intelligent visitors, and conversed freely upon the events of the time. Of the French revolution he is said to have observed, that it was an extraordinary event, and that, as it was without example, so it was without a prognostic. He died on the 20th of March 1793, in the eighty-ninth year of his age, leaving his immense fortune to his nephew Lord Stormont, who also, in virtue of a new patent granted in 1792, succeeded to his title.

Murray's Islands ‖ Murrhine.

The character of this noble and learned person has been ably delineated by Dr Hurd in his preface to the works of Bishop Warburton. That he was, in many respects, an extraordinary man, and that his name will go down to posterity with distinguished honour in the public records of the nation, cannot reasonably be doubted. His shining talents displayed themselves in every department of the state, as well as in the supreme court of justice, his peculiar province, which he filled with a reputation not exceeded by any of his predecessors. As a politician, he had too little courage to be the leader, and too much ability to be the dupe, of any party. He was believed to speak his own sense of public measures; and the authority of his judgment was so high, that, in ordinary times, the house was usually guided by it. He was not a forward nor a frequent speaker, but reserved himself for occasions worthy of himself, and never spoke except on subjects which he had carefully considered. In debate he was eloquent as well as judicious; or rather he became eloquent by his wisdom and good sense, flowing in apt terms, and in the clearest method. He affected no sallies of imagination, no bursts of passion, no mere *tours de force;* much less did he condescend to personal abuse or virulent altercation. All was clear and apparently candid reason, instilling itself so easily into the minds of his hearers, as at once to convey information and to carry conviction along with it. He shrunk from direct contention with Chatham, when Chatham came forth in his might; and he is even said to have been overawed by the ascendency of that great man's powers, or at least restrained by his fierce and unsparing invective. But this may, with some reason, be doubted. He knew that such triumphs are always temporary, often momentary; that it is not by sudden coruscations of genius or eloquence that a deliberative assembly is permanently or effectually influenced; that to effect such an object, genius must ally itself with reason, enlightened by knowledge, and directed by judgment; and that it is by the force of persuasion alone that the decisions of such a body can ultimately be determined. In this conviction he seems to have formed himself to the truest and best manner of speaking. His powers of genius and invention were confessedly of the first order; but he owed less to them, perhaps, than to the diligent and studious cultivation of his judgment. In private life Lord Mansfield was easy, friendly, and engaging; extremely sensible of worth in other men, and ready upon all occasions to countenance and patronize it. (A.)

MURRAY. See MORAYSHIRE.

MURRAY'S ISLANDS, three small islands in the Eastern Seas, in Torres Straits, between the coast of New Guinea and New Holland. Long. of the largest 144. 2. E. Lat. 9. 54. S.

MURRHINE, MURRHINUS, Μορρῖνος, in *Antiquity*, an appellation given to a delicate sort of ware brought from the East, of which were made cups and vases, that added not a little to the splendour of the Roman banquets. Critics are divided concerning the matter of the *pocula* or rather *vasa murrhina*, *murrina*, or *murrea*. Certain persons conceive them to have been the same with our porcelain or china ware. But the commonly received opinion is, that they were made of some precious kind of stone, which, according to Pliny, was found chiefly in Parthia, but more especially in Caramania. Arrian tells us, that there was a great quantity of

Murten ‖ Musæus.

them made at Diospolis, in Egypt. This he considers as another sort of murrhine work; and it is evident, from all accounts, that the murrhine of Diospolis was a sort of glass ware, made in imitation of the porcelain or *murrha* of India. There is some difference in the accounts given by Pliny and Martial of the *murrhina vasa*. The former says, that they would not bear hot liquors, and that only cold ones were drank out of them. The latter, on the other hand, tells us that they bore hot liquors very well. If we credit Pliny's account, their porcelain was much inferior to ours in this particular. Some conjecture them to have been of agate, others of onyx, and others of coral. Baronius, doubtless, was farthest out of the way, when he took them to be of myrrh congealed and hardened. Some suppose these vessels to have been made of crystal, but this is contrary to the account of all the ancients. Pompey was the first who brought from the East murrhine vessels, which he exhibited in his triumph, and dedicated to Jupiter Capitolinus. But private persons were not long without them; and so fond did the Roman gentry become of these vessels, that a cup which held three sextaries was sold for seventy talents.

MURTEN, usually by the French called Morat, is a city of Switzerland, in the canton of Friburg, situated on a lake of the same name, in a very fertile district. It contains 1500 inhabitants, who, from their position on the great road between Basil and Berne, have a little trade. It is celebrated for the defeat of the army of Charles the Bold, duke of Brunswick, by the Swiss, in the year 1476, after the long and unavailing siege of the place by that prince. The bones of the slain in that combat were long preserved in a house built for the purpose, but it was destroyed by some French invaders in 1798. A new memorial of the event has been constructed, consisting of a fine obelisk, with the simple inscription, "Victoriam XXII Jun. MCCCCLXXVI. patrum concordia partam novo signat lapide respublica Friburgensis MDCCCXXII."

MURVIEDRO, a celebrated town of Spain, in the province of Valencia. It is at the foot of a mountain of black marble, on the ruins of the famous city of Saguntum, whose ancient theatre still exists and attests its former grandeur. It is an exact semicircle, about two hundred and fifty feet in diameter; the inner diameter, or orchestra, is twenty-four feet; the seats for the auditors, the staircases, the passages, arched porticos, and entrances, may still be accurately traced. This theatre was calculated to contain 10,000 spectators, and is the most imposing of all the monuments of very high antiquity that are left in Spain. The view from the hill behind the theatre is represented by all travellers as most delightful. The country it overlooks is fertile and verdant, being covered with trees, and studded with houses, whilst the streams of the river Palancia are diverted into numerous channels to irrigate and fructify the whole plain. The castle of Saguntum is by recent observation in east longitude from London 0. 12. 45., and in north latitude 39. 40. 36. The city now contains 6810 inhabitants, a church, a castle, and three monasteries.

MUSA, or MOOSA, a village of Arabia, in the province of Yemen, about twenty miles to the east of Mocha. It is surrounded with walls, and is still populous, though the trade is now transferred to Mocha.

MUSÆUS, an ancient Greek poet, was, according to Plato and Diodorus Siculus, an Athenian, the son of Orpheus, and chief of the Eleusinian mysteries instituted at Athens in honour of Ceres. According to others, he was only the disciple of Orpheus, though, from the great resemblance between his character and talents and those of his master, he was called his *son*, as those were styled the *children of Apollo* who cultivated the arts of which he was the tutelar god. Musæus is allowed to have been one of the first poets who versified the oracles. He is placed in the Arundelian marbles, in epoch fifteen, 1426 B. C. at which time his hymns are there said to have been received in the celebration of the Eleusinian mysteries. Laertius tells us, that Musæus not only composed a theogony, but formed a sphere for the use of his companions; yet as this honour is generally given to Chiron, it is more natural to suppose, with Sir Isaac Newton, that, after the conquest of the golden fleece, he enlarged it with the addition of several constellations. The sphere itself shows that it was delineated after the Argonautic expedition, which is described in the asterisms, together with several other more ancient histories of the Greeks. Musæus is celebrated by Virgil in the character of hierophant, or priest of Ceres, at the head of those illustrious mortals who had merited a place in Elysium.

Musculus ‖ Muses.

A hill near the citadel of Athens was called *Musæum*, according to Pausanias, from Musæus, who used to retire thither to meditate and compose his religious hymns, and in which place, also, the poet was afterwards buried. The works which went under his name, like those of Orpheus, were by many attributed to Onomacritus. Nothing now remains of this poet, nor were any of his writings extant in the time of Pausanias, except a hymn to Ceres, which he made for the Lycomides; and as these hymns were likewise set to music, and sung in the mysteries by Musæus himself in the character of priest, he thence perhaps acquired the title of *musician*, as well as of *poet*, the performance of sacred music being probably at first confined to the priesthood in these celebrations, as it had before been in Egypt, where they originated. He, however, is not enumerated by Plutarch amongst the ancient musicians; nor does it appear that he merited the title of son and successor to Orpheus so much on account of musical abilities, as of his poetry, piety, and profound knowledge in religious mysteries.

MUSCULUS, a military machine, made use of by the Romans to cover and protect the soldiers whilst they approached and undermined the walls of besieged places, or filled the ditches. It seems to have resembled the testudo in form, but to have been smaller in size.

MUSEIA were Grecian festivals in honour of the Muses, celebrated with games every fifth year, particularly by the Thespians. The Macedonians also observed a festival of the same name in honour of Jupiter and the Muses.

MUSES, certain fabulous deities amongst the Pagans, who were supposed to preside over the arts and sciences. The Muses were originally mere singers and musicians in the service of Osiris, or the great Egyptian Bacchus, under the instruction and guidance of his son Horus; but in succeeding times they were denominated the "daughters of Jupiter and Mnemosyne." Sir Isaac Newton tells us, that the singing women of Osiris were celebrated in Thrace by the name of the *Muses;* and that the daughters of Pierius, a Thracian, who imitated them, were celebrated by the same name. Diodorus Siculus informs us, that Alcman of Messene, a lyric poet who flourished in the 27th Olympiad, or 670 years before Christ, makes them the daughters of Uranus and Terra. It has been asserted by some ancient writers, that at first they were only three in number; but Homer, Hesiod, and other profound mythologists, admit of nine. In his hymn to Apollo, Homer says, "By turns the *nine* delight to sing;" and Hesiod, in his Theogony, names them all. They are said to preside severally over some art or science, as music, poetry, dancing, astronomy. By certain authors they are called *virgins*, because the virtues of education appear unalterable; they are called *Muses*, from a Greek word which signifies to explain mysteries, because they have taught things the most curious and important to be known, but which are above the comprehension of vulgar minds. Each of their names

Museum ‖ Mushed.

is said to include some particular allegory. *Clio*, for instance, was so called, because those who are praised in verse acquire immortal fame; *Euterpe*, on account of the pleasure accruing to those who hear learned poetry; *Thalia* implies for ever flourishing; *Melpomene* indicates that her melody insinuates itself into the inmost recesses of the soul; *Terpsichore* marks the pleasure which those receive who are versed in the liberal arts; *Erato* seems to signify that the learned command the esteem and friendship of all mankind; *Polyhymnia* intimates that many poets are become immortal by the number of hymns which they have addressed to the gods; *Urania* means that those whom she instructs elevate their contemplations and celebrity to the heavens and the stars; and, lastly, the exquisite voice of *Calliope* has acquired her that appellation, as the inventress and guardian of eloquence and rhetoric. Concerning the Muses, the ancients had numberless ingenious and fanciful ideas, on which it would be useless to expatiate. It seems as if the first poets, enchanted with the beauties of nature, were occasionally led to invoke the nymphs of the woods, hills, and fountains; and that, yielding to the prevailing taste for allegory, they gave to these, names relative to the influence which they might be supposed to have over the productions of the mind. At first three Muses only were admitted; but in proportion as improvement was made in the art of versification, its characters and effects were personified, the number of the Muses increased, and the names they now received referred to the charms of poetry, its celestial origin, the beauty of its language, the pleasure and gaiety it inspires, the song and dance which add to it new charms, and the glory with which it is crowned.

MUSEUM, a name that originally signified a part of the palace of Alexandria, which occupied at least one fourth of the city. This quarter was called the *Museum*, on account of its being set apart for the worship of the Muses and the study of the sciences. Here were lodged and entertained the men of learning, who were divided into many companies or colleges, according to the sciences of which they were the professors; and to each of these houses or colleges was allotted a handsome revenue. The foundation of this establishment is attributed to Ptolemy Philadelphus, who here placed his library. Hence the word *museum* is now applied to any place set apart as a repository for things which have an immediate relation to the arts.

MUSHED, or Mesched, a city of Persia, the capital of the province of Khorassan, surrounded by a wall, and said by some to be twelve miles in circuit, but by Fraser estimated at not more than six miles. The greatest length to which the town extends is not above two miles, and the enclosed space presents a sad picture of desolation; the approach to the centre of the city, where the inhabitants exclusively reside, being through masses of ruins. There are thirty-two divisions in the city, each being nominally governed by its own magistrate; but of these many are totally devoid of either houses or inhabitants, and the greater part of the rest are very thinly tenanted. The city appears to have been built of sun-dried bricks or mud, so that the whole aspect of the place presents the monotonous gray earthy colour common to all Persian towns; and even the houses which remain entire are miserably poor and mean in their outward appearance, nor are they much better furnished within. The approach to these houses harmonizes with all the other details, being for the most part through dark lanes and narrow alleys, extremely inconvenient and filthy. Fraser informs us, that in his walks he occasionally stumbled upon the strangest holes and corners, where houses peered out that were half hid in filth and rubbish. He adds, that the path among such places sometimes burrows under the earth, or beneath a heap of buildings which have been raised over it, upon a floor of beams and mats; and that, after thus descending, as it seemed, into the bowels of the earth, a door was opened into a small parterre, surrounded with various apartments, and fitted up with reservoirs and fountains of water, trees, and flowers. There is only one street worthy of the name, which extends throughout the whole length of the town, running north-west and south-east. In the centre is a canal, which serves as a receptacle for all the filth of the town, and is in a state of great disrepair. A row of shops extends along the pathway on either side; and there is a bazaar in another quarter, which extends from 500 to 600 yards in one direction. The public buildings of Mushed are very splendid, and highly celebrated for their sanctity. The tomb in which repose the ashes of the Imam Reza and of the Kaliph Haroun Al Raschid, is an extensive and most magnificent structure, which has been embellished and enriched by different princes. This magnificent cluster of domes and minarets is situated in the centre of the city, where there is a noble oblong square, 160 yards in length by 75 in breadth, with gateways at either end, and forms a splendid specimen of the style of eastern architecture. The mausoleum itself comprises a mass of buildings which appear to be of the octagon form; and a silver gate, the gift of Nadir Shah, admits into the passage to the chief apartment, beneath a gilded cupola of magnificent dimensions, rising loftily into a fine dome, from the centre of which depends a huge branched candlestick of solid silver. There are numerous other apartments, a description of which will be found in Fraser's account of his journey to Khorassan. Mushed contains no other religious shrine worthy of notice. There is a large ruined mosque with two minarets; and there are numerous other smaller ones to be found in all quarters of the city. There are also sixteen schools or colleges, ten or twelve public baths, and at least twenty-five or thirty caravanserais; many of them spacious and handsome establishments, whilst others are in ruins. The palace of the prince is a poor fabric, scarcely deserving of notice. Mushed contains the tombs of Nadir Shah and his son, though not their dust; their remains having been dug up by their bitter enemy Mahommed Khan, and carried to Teheran. This city rose into importance during the contests between the Mahommedan sects of the Soonies and the Sheahs, under the patronage of Tahmareb, a zealous Sheah, and a prince of the Suffanean dynasty, who decorated the tomb of Imam Reza. It was taken and pillaged by the Tartar tribes; and it was again utterly ruined by the Afghans, and scarcely restored to its former magnificence by all the favours which were lavished on it by Nadir Shah. Its commerce is considerable, being an entrepôt for that of the surrounding countries, and rich caravans daily arriving from Bockhara, Khyvah, Herat, Kerman, Yezd, Cashan, Ispahan, and other cities. There are in Mushed many merchants, with a considerable number of shopkeepers and tradesmen; and one quarter of the city is appropriated to the Jews, who are here tolerably numerous, and exercise their customary profession of scrap sellers. Of travellers, whether in the way of religion or of commerce, numbers are to be seen from all the surrounding countries, such as Arabs, Turks, Afghans, Turcomans, Usbecks, in the different caravanserais and bazaars of Mushed. It is famed for the manufacture of velvets, which are esteemed the best in Persia; and of sword-blades, which sell, many of them, at from fifteen to a hundred reals a piece, or from L.1 to between L.6 and L.7. Those of them made by the old workmen sell as high as 2000 reals; and even more is sometimes demanded for a blade of known antiquity and goodness. The vicinity of the turquoise mines gives employment to numerous stone-cutters. The population is estimated by Fraser at 31,000. Long. 57. E. Lat. 37. 35. N.

Mushed.

MUSIC.

Music. Introduction.

WITHIN the limits necessarily prescribed to this article, it is impossible to do more than touch upon a few points belonging to the subject. A complete treatise upon the theory and practice of music, according to the received doctrines, would contain about six thousand articles, and would fill several volumes. In writing this article, we have frequently availed ourselves of materials offered by the best and latest musical authorities. When so many works have been published by skilful professional musicians upon their art, we have not the presumption to suppose that we can add much that is new; more especially as we have no new theory to propose, and to maintain with Quixotic zeal and recklessness. Whenever we differ from authorities generally followed, we express our dissent, and give our reasons for it. Our main purpose is to direct attention to some useful musical objects, hitherto in general too much overlooked; to point out some errors in the theory and practice of music; and to show the utter uselessness of pursuing the old routine of building up false theories of music, and spending years in the vain study of what is called thorough bass, and is even still considered, by too many persons, as comprehending the whole art and science of music. To attempt to make any one a composer of music by means only of dry treatises upon intervals and chords, is just as absurd as to attempt to make a poet by means of Bysshe's Art of Poetry, or other books of the kind. Genius and observation, and a careful study of the best models, are really the only things that can ever make a good poet, or a good painter, or a good composer of music. The aid of a skilful master will be of great importance, if he is not wrapped up in a theory. In the absence of a master, two or three of the best modern treatises, such as Reicha's and Cherubini's, may help the student to understand the construction of those models of composition which he ought to have constantly before him. We suppose the reader to understand musical notation, and to be able to sing, or to play upon some musical instrument. If this should be the organ, or piano-forte, so much the better for his more easy attainment of a knowledge of harmony; although he must always remember that both these instruments are *out of tune*, and do not produce perfect intervals or perfect harmony. If the student of musical composition would acquire a real dominion over the materials of his art, he must not trust entirely to his organ or piano-forte. He must learn to read, in silence, any piece of music in score (in partition), and to hear, "in his mind's ear," the effect of the whole; and he must learn to compose in silence, and without the aid of any instrument. All great composers have acquired these powers. This seems, to the vulgar musician, impossible. To mention only one instance of such powers among living artists; Cherubini composes all his music with the aid of no other instruments but pen, ink, and paper. We have seen him at work. An accomplished composer is able to form in his mind, with no aid from any instrument, the whole plan and details of a complicated piece of harmony, before he writes a note of it. In his "mind's eye" he *sees* the whole score; in his "mind's ear" he *hears* the effect which the piece would produce if performed. Until the student acquires this power of abstraction, he must consider himself as only on a par with those every-day musicians whom the "fatal facilities" of the organ or piano-forte raise into the ephemeral class of pseudo-composers.

Some persons consider music as a frivolous and useless art. They do not feel nor understand music, and they are not to be blamed for this when nature has denied them a musical ear, any more than a blind man is to be blamed for not admiring painting or sculpture, or a blind and deaf man for not admiring poetry. But really, when musical compositions are frivolous and useless, the fault is in the artist, not in the art. If men choose to write bad poetry, to paint bad pictures, to chisel bad sculptures, this can never prove that poetry, painting, and sculpture, are frivolous and useless arts. Every one of the fine arts may be rendered frivolous and useless by misapplication of its means; nay, some of them may be made highly dangerous and mischievous, as has often happened. No doubt all the fine arts may be considered in one point of view as *superfluous* things, not at all contributing to the *necessaries* of human existence. Food, clothing, fire, and shelter, are really all that man's mere animal existence requires to keep him alive. But if poetry and music, and painting and sculpture, cannot till the earth, nor build hovels, nor make clothing, nor kindle coal-fires, they can at least add ornaments to the structure of civilized society, and contribute to the innocent pleasures and happiness of man's transitory life. And it seems to be proved by experience, that the cultivation of these arts, how unimportant soever they may be to mere animal existence, has always tended to divert the attention of mankind from the sole indulgence of their animal appetites, and of their more dangerous passions. If so, it would not be wise to deprive man of such sources of innocent and pleasing occupation, or rather relaxation, and to reduce him to the merely animal state of the savage, who enjoys and admires nothing beyond his animal comforts, and his murderous triumphs over his rivals or his enemies.

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Many persons are so constituted, or so trained, as to have no relish for poetry, or painting, or music. So much the worse for them, perhaps, since their want of feeling or imagination deprives them of sources of innocent pleasure open to others. If a mere mathematician should be dissatisfied with the works of a great poet, because these works *prove* nothing mathematically, a lover of poetry must not take offence at the mathematician. The lover of poetry, perhaps himself a poet, may be totally insensible to the beauties of the most profound mathematical reasonings, or the finest musical compositions. This often happens. But it rarely happens that the real lover of music is not also a lover of poetry and of painting. We have known men high in the literary and scientific world, upon whom the best music produced no other impression than that of an agreeable or a disagreeable noise. But this never made us respect them the less for their own *peculiar* powers of feeling and thinking. They were not so organized as to feel and think as we did. That was all. The wiser and more philosophical plan is, not to be angry with any of our fellow-creatures for not feeling and admiring as we do; but to regret that they cannot feel and admire with us, because such communion of feeling and admiration would serve to draw those persons closer to us in human fellowship. To call a man a blockhead, because he does not, or cannot, feel and think in every thing exactly like ourselves, is merely to be at once ill natured, uncharitable, and unphilosophical. It is, "*not to know ourselves.*" *Non omnia possumus omnes.* We find no fault with men who *cannot* perceive the beauties of music. We find fault with the perversions of an art which we ourselves feel to be a fine and expressive one, too often deformed and perverted.

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Definition of music.

Most treatises on this subject begin with a definition of music. To persons who already understand music thoroughly, any attempt at such a definition is unnecessary. They have already formed their own ideas of music as an art. To persons ignorant of music, any such definition is quite unintelligible. The extent, the complexity, and the mutability of the art, render all such definitions imperfect and objectionable. The best way in this, as in all others of the fine arts, is to leave the student to form his own definition, after he has thoroughly studied the art. We follow this plan.

In some of the latest and best works on music, we find a definition of it attempted in this manner: "The art of expressing an agreeable play of feelings by means of sounds." But music often expresses the most painful and tragical feelings. Another is, "The art of expressing determinate feelings by means of regulated sounds." And then follows a long description of the nature of all the various branches of music; which is just tantamount to a confession that the definition is unintelligible and useless without the lengthy description.

Leibnitz had a strange metaphysical notion of music, which he thus expressed: "Musica est exercitium arithmeticæ occultum nescientis se numerare animi; multa enim facit in perceptionibus confusis seu insensibilibus, quæ distinctâ apperceptione notare nequit. Errant enim, qui nihil in anima fieri putant, cujus ipsa non sit conscia. Anima igitur etsi se numerare non sentiat, sentit tamen hujus numerationis insensibilis effectum, seu voluptatem in consonantiis, molestiam in dissonantiis inde resultantem. Ex multis enim congruentiis insensibilibus oritur voluptas," &c. Descartes entertained similar notions; and Euler, in his *Tentamen Novae Theoriae Musicae*, assures us that the ear is pleasingly or unpleasingly affected by musical intervals, according to its perception of the simplicity or of the complexity of their ratios of vibration. His measures of these ratios do not agree with practice. But the absurdity consists in supposing such an auricular arithmetic, by which the ear judges of the ratios of intervals. Does the milk-maid calculate the ratios of the intervals in her untutored song, and take pleasure in it, or the reverse, according to her perception of their simplicity or complexity? In Italy we may hear persons who cannot read music, singing very agreeably in two, or three, or four parts, in harmony. Do such persons know any thing of the harmonic ratios of the sounds they combine together in this way? They have no more idea that even an octave is in the ratio of 1 : 2, than they have of the distance between the earth and the moon. Similar false applications of mathematics have tended greatly to produce that mysterious obscurity which has hitherto been artificially thrown over the beautiful and inviting regions of musical melody and harmony. There, genius and perseverance have culled the sweetest flowers; while mathematical investigations have, as yet, only groped among the soil from which these blossoms sprang.

Theories of music.

The state of our knowledge of acoustics, one of the most subtile and difficult of sciences, is still too incomplete to permit of the formation of a perfect theory of music, even were music, as a fine art, entirely dependent upon the physico-mathematical science of acoustics, which it is not. Of late years, however, the beautiful experiments of Dr Chladni, M. Oërsted, Monsieur Savart, Professor Faraday, and Professor C. Wheatstone, have thrown much light upon some of the obscurer parts of acoustics.

In another work, we have expressed ourselves in the following terms regarding proposed theories of music. "The mischievous effects of false principles have been experienced in every branch of physical science. The blind rashness of premature generalization has operated with as great absurdity in music as in any other branch of human knowledge. While music was in its infancy, and while the observations and experiments which had been made respecting it were confined within limits by much too narrow to permit the formation of just and comprehensive general principles, musicians, both practical and speculative, misled by a false philosophy, and by erroneous ideas of simplicity, attempted to establish one single principle as the sole basis of musical harmony and composition. Confounding together the essentially distinct methods proper to physical and to mathematical science, they seized upon a particular phenomenon belonging to acoustics, and endeavoured to torture it into a principle which might apply to, and explain, the whole phenomena belonging to musical composition. From a particular fact, which had no necessary connection with musical composition, they attempted, with some ingenuity, and with much sophistry and ineffectual labour, to deduce the whole system of that art; while they were not aware either of the imperfection and incompleteness of the system which then existed, or of the improper method of induction which they had adopted. They employed the synthetical method of induction proper to mathematics, instead of the analytical method of induction, which is the true guide to physical investigation. In mathematics, we make discoveries by reasoning from definitions, axioms, and postulates; in other words, by reasoning from generals to particulars; but in physics, we extend our views and consolidate our knowledge by the opposite method of reasoning from particulars to generals. In physical science, when our observations and experiments have been sufficiently numerous and extensive, we may then, but not till then, establish general laws, or first principles, and reason from these synthetically; but if, on the contrary, the facts from which we generalize have been gathered from a narrow and unenlightened survey of the field of physical science, we shall almost inevitably draw false conclusions, and form principles which involve error and absurdity in relative proportion to the obscurity and contraction belonging to our investigation of particulars.

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"It was long ago observed, that a musical string, or wire, capable of rendering a grave and powerful sound when thrown into a state of vibration, produced, in that state, not only a *principal* sound, corresponding to its length, tension, thickness, &c., but also two audible, concomitant, and accessory sounds, related to the *principal* sound by the intervals of a twelfth, or double (replicate) fifth, and seventeenth major, or second replicate major third. For example, the fourth string, or largest string of the violoncello, when strongly vibrating, may produce these accessory sounds, or *harmonics;* which, although feeble in comparison with the principal sound, may, however, be heard by a delicate and attentive musical ear.

"Upon this acoustical phenomenon, Rameau, a French musician, attempted to found his theory of harmony. We shall afterwards quote the opinions of some of the highest authorities in Europe upon this theory, and also upon that of Tartini, to which we now proceed.

"Tartini, in his *Trattato di Musica*, published at Padua in 1754, informs us, that if two sustained sounds (forming, for example, a third or a fifth) are produced at once from two violins, two trumpets, &c. the result will be the generation of a harmonic third sound, distinctly perceivable by the ear. This phenomenon was observed by Rameau in 1753. Tartini seems to have mistaken the pitch of the third sound, or grave harmonic, produced in this experiment, since M. Serre of Geneva, in his Principles of Harmony, tells us that the grave harmonic sounds produced by major and minor thirds are each an octave lower than those mentioned by Tartini. This phenomenon gave rise to Tartini's theory of harmony. We now make the quotations which we promised. The first is from the works of

Music. the late Professor Robison, whose authority, on such a point, is of indubitable weight. He is writing of Rameau's theory. 'Rameau has made this,' the generation of acute harmonics, 'the foundation of his system of music, asserting that the pleasure of harmony results from the successful imitation of this harmony of nature. But a little logic should convince these theorists that they must be mistaken. A little mathematics, too, or mechanics, would have convinced them. His theory is a very *forced* accommodation of this principle to the practice of musicians and taste of the public.' Speaking further of Rameau's theory, he says, 'It is a mere whim, proceeding on a false assumption, namely, that a musical sound is essentially accompanied by its octave, twelfth, and seventeenth, *in alto*. This is not true, though such accompaniment be very frequent, &c. Are these acute harmonics musical sounds or not? He surely will not deny this. Therefore they too are essentially accompanied by *their* harmonics, and this absolutely and necessarily *ad infinitum*.' Of Tartini's theory he says, 'Tartini prized this observation,' the generation of grave harmonics, 'as a most important discovery, and considered it as affording a foundation for the whole science of music.' After some farther remarks, he adds, 'The system of harmonious composition which Tartini has, with wonderful labour and address, founded on it, has, therefore, no solidity.'

"Dr Chladni, in his celebrated work *Traité d'Acoustique*, expresses himself as follows regarding the theories which we have just mentioned: 'It is not conformable to nature to desire, like many authors, to derive all harmony from the vibrations of a string, and especially from the coexistence of several sounds with the fundamental sound. A string is *only one* species of sonorous body.

"'In many other sonorous bodies the general laws of vibrations, which were not known, are differently modified, consequently the laws of one sonorous body cannot be applied to that which ought to be common to all. A monochord cannot serve to establish the principles of harmony, but only to give an idea of the effect of ratios.'.....'Many authors have regarded the co-existence of sounds comprised in the natural series of numbers (which, according to true principles, is nothing but a particular phenomenon) as an essential difference between a distinct sound and a noise. They have taken this quality for the basis of all harmony, believing that an interval is consonant, *because* the acute sound may be heard along with the fundamental sound. They do not know that, if more than one sound is heard at the same time, this is nothing more than a consequence of the existence of many species of vibrations; that in many sonorous bodies the series of possible sounds is very different from the natural series of numbers; and that we may produce each manner of vibrations, where there are nodes, without any mixture of other sounds, by touching the nodal points, or lines, which ought to be in motion in other manners of vibrating.

"'According to their principles, the perfect minor chord—if one does not make use of sophisms—would not be consonant; and, on the bell of the harmonica, the ninth (4 : 9) would be the first consonance, since it is the first sound which can mingle itself with the fundamental sound, &c. Daniel Bernouilli and Lagrange have sufficiently refuted these false principles.'

"With respect to Tartini's theory in particular, he says, 'Tartini pretended that this third sound was more acute by an octave than it really is. He regarded this phenomenon, combined with the pretended co-existence of the series of sounds 1, 2, 3, 4, 5, &c. in each fundamental sound, as the basis of harmony. Mr Mercadier de Belesta has very well refuted some false assertions of Tartini, in his *Système de Musique*, Paris, 1776.'

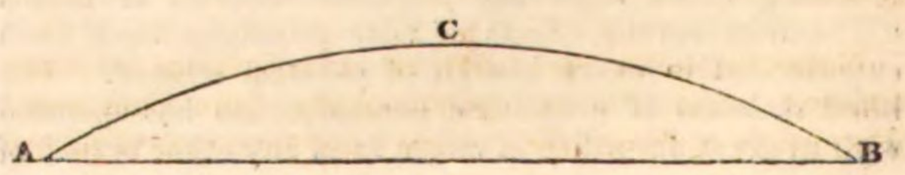
"Choron, in his work upon composition, says, 'It has been attempted to deduce the laws of succession from the multiple resonance, or from the sub-multiple resonance. Tartini had hardly discovered this last phenomenon, when he hastened, in order to satisfy the taste of his time, to rear up upon it a system, which he gave to the world in a very unintelligible work. J. J. Rousseau, who was almost equally a stranger to geometry and to the science of composition, produced, without having even comprehended it, a very imperfect analysis of it (Tartini's system) in his shapeless dictionary, and exalted it to the utmost of his power, for the pleasure of mortifying Rameau, with whom he had some quarrel.

"'With the phenomenon of the multiple resonance, of which he had considered no more than the three first terms, Rameau had propped up his system of the fundamental bass. Without entering more into detail, I shall remark, that this phenomenon has no connection with the laws of harmony. That if one absolutely would apply it to them, it would be necessary, *first*, in order to be consistent, to suppose, at least implicitly, that the sounds of the system are those of the series of aliquots: first absurdity. *Second*, That all the notes of the bass ought to be accompanied by all their aliquots, moving in a parallel manner with each other: second absurdity. Every other consequence is illegitimate, and tends, not to give a foundation in nature to the rules of harmony, but to reconcile, as one best can, the phenomena with the rules of harmony, which is a very indifferent matter.'"

In 1753, M. Serre, a miniature painter at Geneva, published his *Essais sur les Principes de l'Harmonie*. He assumed three essential fundamentals in the scale; the tonic, the fifth, and the fourth. He described the nature and use of what he termed *diacommatic* intervals, or slides necessary to perfect intonation in various modulations; and he laid down as a principle, that it depended upon the nature of the intervals of a chord whether that chord should have *one* or *two*, or even *three* fundamentals. These opinions of M. Serre's have been of late years, and with some modifications, reproduced as new. In some works recently published, we have observed an analogy pointed out, as new, between the harmonics above mentioned and the curious phenomena of complementary colours. In Blackwood's Edinburgh Magazine for February 1823 (pp. 159–162), will be found a letter of ours in Italian, in which this analogy is particularly noticed, and a short description of some of the phenomena given. In the same letter there are some remarks upon the analogy between the harmonic series 1, 3, 5, 7, &c. and the progression of numbers 1, 3, 5, 7, ascribed by Newton to the squares of the diameters of the coloured circles produced by him on applying to the plane side of a plano-convex lens one of the convex sides of a double convex lens.

A strange error has long prevailed regarding the co-existent vibrations of a musical string. The *total* vibration which gives the gravest sound of the string, can by no means *co-exist* with the vibrations of the aliquot parts of the same string. The thing is physically impossible, as could be easily demonstrated. In fact, to assert that a vibrating string can move in a number of *different* and *opposite* directions at the same instant of time, is as absurd as to maintain that a man can run backwards and forwards, to the right and to the left, &c. all at the same moment. The following diagrams represent the three primary curves of the harmonic series 1, 2, 3.

1.



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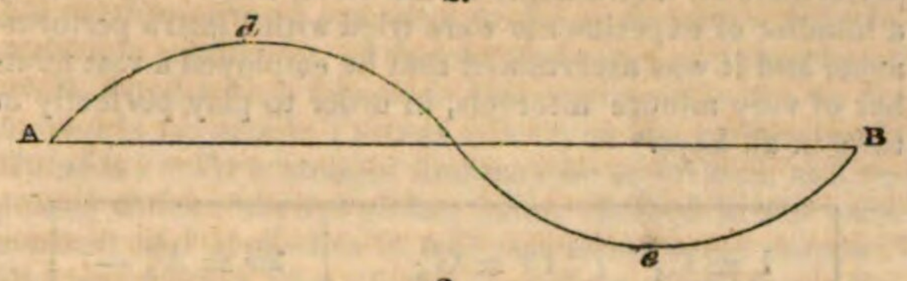
2.



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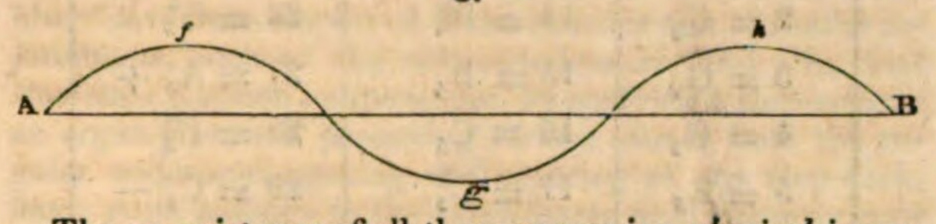

The co-existence of all these curves is a *physical impossibility*. For *how* can ACB *coincide* with A*de*B, or with A*fgh*B? It is needless to go farther. There may be many *co-existent* vibrations of traction and torsion in the string, but not any *co-existent* vibrations in directions quite opposite to each other.

The musical treatises of Choron, Catel, and Momigny, &c. among the French, and of Reicha and others among the Germans, are still too much tinctured with peculiar and arbitrary theories and systems, for which there are no sufficient grounds in either acoustics or æsthetics. By this last term the Germans have long chosen to designate, not very appropriately, the theory of taste in the fine arts. It is indeed impossible, by any purely mechanical and mathematical theories, or even by any metaphysical ones, to explain all the varieties of human sensations, affections, passions, that enter into our perceptions of beauty, sublimity, &c. in poetry, painting, or music. It cannot be too often repeated, that all the *rules* laid down by theorists for the construction of works belonging to the fine arts, are drawn from models of art previously in existence, and relate merely to the mechanical portions of these arts.

Had the rigid rules formed for (and from) the ancient Greek drama been always adhered to, we should never have possessed Shakspeare's plays. The magnificent musical works of Haydn, Mozart, and Beethoven, not to speak of many other great German and Italian composers, were not produced by blind adherence to old rules of art, but by an enlightened view of things, far beyond what the authors of these rules contemplated. Bühle has remarked, that the mechanical rules laid down in treatises on the fine arts may be compared to telescopes, which assist the vision of those persons who already see. A remarkable instance of this is found in the case of Beethoven, who happened to be placed under a master destitute of genius for melody; but a profound harmonist, and a learned writer of fugues and canons, &c. Under this man, Beethoven laboured most industriously, and went through the whole drudgery of thorough bass, and all the rigid ancient rules of composition; but evidently with frequent misgivings as to the general truth and application of what was taught to him. But the result was, that these lessons and *rules* served him as a "telescope," to enable him to perceive a wide field of composition far beyond them all. In short, he was a man of first-rate musical genius, and therefore by nature a great melodist; and, fortunately for the world, his injudicious training *could* not extinguish his passionate feeling for melody, and his charming expression of it in his best works. In some of his works, especially among his last, we find unpleasing traces of the predominance of his early training over his native genius. But his latest works were composed when he had been for many years perfectly deaf.

The sense of hearing.

Notwithstanding the laborious investigations of many eminent anatomists and physiologists, from Comparetti downwards to Magendie, the uses and functions of all the various parts that compose the human ear are by no means well understood.

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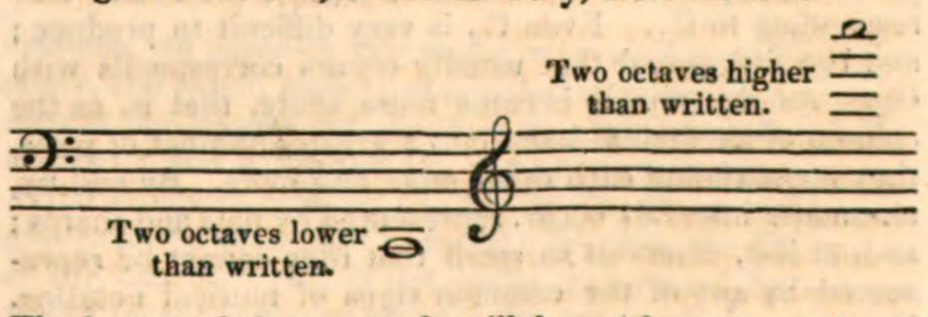
The perceptive powers of the ear differ considerably among mankind, especially as regards the perception of the various qualities and relations of musical sounds. In like manner, we find that the perceptions of form, proportion, colour, &c. are by no means always the same in every human eye. Perfection of the eye is requisite to the painter; perfection of the ear to the musician. Sometimes persons are found who cannot distinguish colours, or shades of colour, from each other. Perhaps more frequently instances are met with of persons whose perceptions of the differences between musical sounds are very imperfect. We have been informed that Mr Pond, the late astronomer royal, though a real lover of music, and capable of hearing distinctly sounds of a grave pitch, or of a middle pitch, was incapable of hearing very acute sounds, whether musical or not, which were perfectly audible to other persons; for example, the loud chirping of a number of crickets in a room, and the very piercing sound produced by turning round the ground-glass stopper of a bottle containing calomel. The stopper was turned round close to Mr Pond's ear without producing any sensation. All this clearly proved that Mr Pond's ear, however perfect in other respects, was incapable of conveying any perception of very acute sounds.

All vibrations sufficiently rapid and powerful to act upon the auditive organs produce the sensation of sound. To enable us to hear slow vibrations as well as more rapid ones, it would be necessary, according to Riccati, that the intensity of each simple vibration should be in proportion to its duration. For this reason, says Chladni, and on account of the different organization of each individual, and each kind of animal, there exist no absolute limits to the perceptibility of sounds.

The ear does not distinguish the very small differences of the exact ratios between sounds. Were it not for this illusion, music would have no existence. But this is not to make us seek the less for true intonation, wherever it can be obtained. Few persons are aware how great is the difference between the true intonations of a fine voice, or a violin, &c. and the false intonations of such instruments of fixed sounds as the organ, piano-forte, &c. Many singers, trained to the intonation of a piano-forte, have their ear and voice so misled that they can never afterwards learn to sing in tune. The famous Madame Mara condemned the use of the piano-forte in learning to sing. She said every singer ought to learn to play on the violin, in order to know what true intonation is.

The different quality (*timbre*) of a musical sound and its articulations, says Chladni, are among the most remarkable objects of audition. They do not appear to depend on the manner of vibration, nor (or very little) upon the form of the sonorous body; but rather on the matter of the sonorous body, and that of the body by which it is rubbed or struck, as well as on the matter which propagates the sound. We have not the least idea of the nature of these different characters of sound, nor of their propagation.

The limits usually assigned to musical sounds, reckoning from grave to acute, or the contrary, are as follows:



The lowest of these sounds will be such as is produced by an open organ-pipe of 32 feet in length, and the num-

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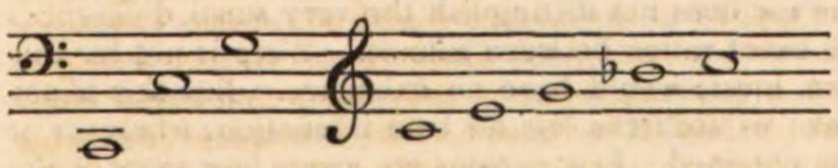
Production of series of musical sounds.

If we take a vibrating musical string or wire, perfectly uniform in thickness, and homogeneous throughout, and divide it into its aliquot parts, its half, its third, its fourth, its fifth, and so on, we shall obtain, by this division of the *monochord*, as it is called, a great many of the sounds belonging to our musical system. A number of these sounds can be obtained from it by lightly touching it at these divisions, as happens when we produce harmonics on the open string of a violin, &c.; and all these sounds are *true*, or nearly true, if the string is perfect; otherwise they are not. This frequent imperfection in the uniformity and homogeneity of strings is one great obstacle to perfect intonation. Again, if we take an organ-pipe, or a French horn, &c., and blow into it in such a manner as to produce its natural series of sounds, we shall have, beginning with the lowest, a series corresponding (in ratio of vibrations of the column of air contained in it) to the arithmetical series 1, 2, 3, 4, 5, 6, 7, 8, &c. thus:



&c.

These sounds also are *true* harmonics, supposing the sonorous tube properly constructed, and the force of the blast suitably regulated. If we push this harmonic generation of sounds still farther, we may obtain a number of other sounds, some of which, though apparently *false* as regards our artificial temperament on instruments of fixed sounds (such as the organ, piano-forte, &c.), are yet *true*, or nearly so, as regards the intervals which occur in *true intonation*.

There is no room here to enter into a discussion of this curious and intricate subject. We shall content ourselves with giving a table of the harmonics obtainable from an open cylindrical glass tube furnished with a suitable mouthpiece, and fitted to an organ-bellows. This table shows that the gravest sounds obtainable from the tube are removed from each other by wide intervals. Thus the two first sounds, C_1 and C_2 are separated by the interval of an octave. G_2 is a fifth above C_2, and C_3 is a fourth above G_2, and so on. This is the series followed by the natural sounds of such instruments as the horn, trumpet, serpent, &c.; but it is extremely difficult, or nearly impossible, to produce on these instruments the sound corresponding to C_1. Even C_2 is very difficult to produce; and the first sound that usually occurs corresponds with G_2. As the sounds become more acute, that is, as the column of air divides itself into a greater number of parts, they approximate each other more and more. By and by, chromatic intervals occur, represented by flats and sharps; and, at last, intervals so small that they cannot be represented by any of the common signs of musical notation. But these smaller intervals are necessary to perfect musical intonation, and are employed by the best singers and performers on instruments of the violin kind. In France, a number of experiments were tried with Viotti's performance, and it was ascertained that he employed a vast number of very minute intervals, in order to play perfectly in tune in all keys. Music.

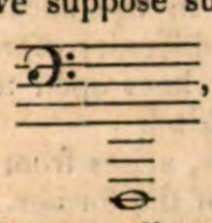
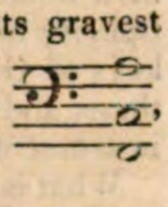
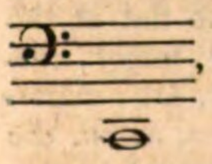
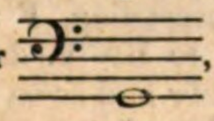
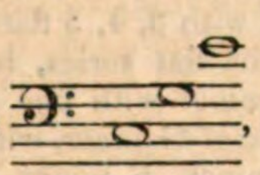
$1 = C_1$	$13 = G^{\sharp}_4$	$25 = A^{\flat}_5 -$
$2 = C_2$	$14 = B^{\flat}_4$	$26 = G^{\sharp}_5$
$3 = G_2$	$15 = B_4$	$27 = A_5 +$
$4 = C_3$	$16 = C_5$	$28 = B^{\flat}_5$
$5 = E_3$	$17 = C^{\sharp}_5$	$29 = C^{\flat}_5 -$
$6 = G_3$	$18 = D_5$	$30 = B_5$
$7 = B^{\flat}_3$	$19 = E^{\flat}_5$	$31 = C_6 -$
$8 = C_4$	$20 = E_5$	$32 = C_6$
$9 = D_4$	$21 = F_5$	$33 = D^{\flat}_6 -$
$10 = E_4$	$22 = G^{\flat}_5$	$34 = C^{\sharp}_6$
$11 = G^{\flat}_4$	$23 = G_5 -$	$35 = D_6 -$
$12 = G_4$	$24 = G_5$	$36 = D_6$

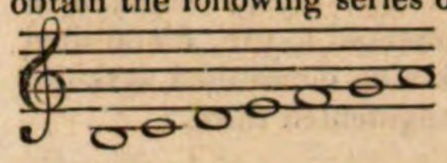
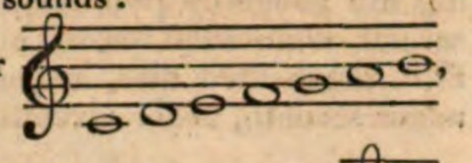
In treating of the musical sounds produced by sonorous bodies, such as vibrating strings, or wires, or springs, or columns of air in tubes, &c., it is rarely kept in view that in these, as in all mechanical phenomena, allowance must be made for the mechanical conditions which may render the actual phenomena not exactly correspondent to the mathematically calculated results. From want of attention to this, many false theories of musical intonation have been adopted. It is quite true, mathematically speaking, that if all the hypothetical conditions of a sonorous body were, as they are assumed to be, in the course of a mathematical reasoning regarding them, the physico-mathematical result deduced by such reasoning, supposing this reasoning accurate, must be perfectly correct. But, in general, such reasoning and deduction are carried on with abstraction made of some of the inevitable physical circumstances which attend the real phenomena. In this way, pure mathematical reasoning is often, in some degree, at variance with mechanical phenomena. A badly formed string, or wire, &c. will not conform to the mathematical calculations as to the sounds that it must produce when divided in such and such ways. Neither will its real vibrations agree with those mathematically calculated. In like manner, the friction, and inequalities and imperfections, of any piece of machinery, will, in the real operations of the latter, produce results in some respects contradictory to the abstract mathematical theory of what the operations of the mechanism ought to be.

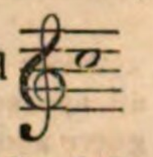
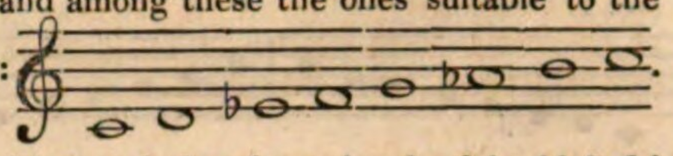
Musical intervals.

A musical interval consists in the difference between two given sounds, in respect to their relative acuteness and gravity. Thus it is evident that the *unison* is not an *interval*, although it is often improperly so called. Aristotle, in the tenth section of his thirty-ninth problem, very correctly designates the unison as being "only the same sound multiplied." But the slightest departure from *unison*, by one of the sounds becoming a little more acute, or the other a little more grave, forms an *interval*, though it may be so *very small* as not to belong to those intervals generally recognised in melody and harmony. The measure of the relative lengths, or vibrations, of two musical strings producing an interval, will be the difference of their respective logarithms, as has been remarked by Dr Smith in his "Harmonics," and by various other subsequent writers. Among these, the late Professor Robison, of Edinburgh

Music. University, pointed out some useful applications of the logarithmic subdivision of the circumference of a pasteboard circle, fitted with a moveable concentric circle, &c. as described in his article TEMPERAMENT, in the present work. He adds: "Or a straight line may be so divided, and repeated thrice; then a sliding ruler, divided in the same manner, and applied to it, will answer the same purpose." We may remark, that these suggestions of Professor Robison have been employed in the construction of similar instruments, without any acknowledgment; and also, that Professor Robison's experiment, by applying a stop-cock to an organ-pipe, and producing various sounds from the regular and rapid opening and shutting of the stop-cock, bears great analogy to the syren instrument recently constructed by M. Cagniard de la Tour. Professor Robison, speaking of his stop-cock apparatus, says, "The intelligent reader will see here an opening made to great additions to practical music, and the means of producing musical sounds, of which we have at present scarcely any conception," &c. We have already mentioned, very briefly, how intervals are produced by the subdivisions of a sonorous string or wire, &c. or of the column of air in a wind-instrument, or in the glass tube before described.

If we suppose such a tube to produce, as its gravest sound,  , its primary harmonics will be  , viz. octave, replicate of fifth, and replicate of third. Carrying the series farther, we shall have one similar to that already given in the table of harmonics. Supposing two other such tubes, the one having for its gravest sound  , and the other  , the harmonics resulting from these respectively will be  , and , and so on, as in the case of the first.

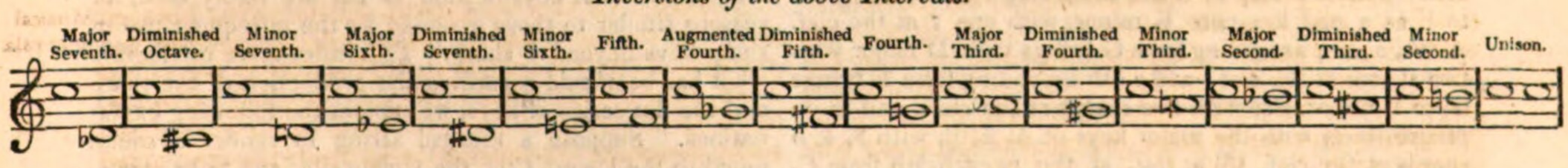
By bringing closer together these dispersed primary harmonics, by means of their octaves above or below, we shall obtain the following series of sounds:  or 

and so on. If to the last of these series we add  at the top, we shall have the major diatonic scale of C. By carrying farther the series of harmonic products of these three tubes, we shall obtain a number of other intervals (see the table), and among these the ones suitable to the scale of C minor:  .

The subject of intervals has been involved in frightful confusion by the number and complexity of names introduced, and the contradictory statements of various writers upon music. We have no space to devote to the clearing up of this chaos; but we may remark, in general, that in this matter, as well as in many others connected with music, there is great need of a reformation in terminology. To glance at only three or four of the misnomers in daily use, without meddling with the more abstruse terms: the fifth diatonic sound of an ascending scale is called the *dominant* of the scale, which signifies the *ruling* or *governing* sound; while, in fact, the tonic, or key-note, and no other, is the chief and ruling sound of the scale, the sound from which, as a common centre, all the others of the scale may diverge, or to which they may converge, like the radii of a circle. This use of the term *dominant* seems to have arisen from the *predominance* of the fifth of the key in ancient church-chants. The term *subdominant* is improper, too, as applied to the diatonic fourth of a scale. The terms *double octave*, *double third*, *double fourth*, &c. are wrong as applied to intervals, because they *imply* that these intervals are *doubled* in the unison, while it is meant to express only the acuter or graver replicates of these intervals in the octave. The same with regard to *triple octave*, &c. When we read of *diminished* or *augmented unisons*, *false fifths*, *superfluous fifths*, *seconds*, &c. &c. we must regret the obscurity of such terms; but meantime we shall use the common terms as we find them, because to introduce new ones abruptly would only add to the confusion already existing.

Table of Intervals in general use.

Inversions of the above Intervals.



Inversion of an interval takes place when the graver sound is carried an octave higher, or the acuter an octave lower. The effect of inversion of intervals may be represented by the following two rows of figures, where it will be seen that 1 or unison, becomes 8 or octave; 2, or second, becomes 7 or seventh, and so on.

1	2	3	4	5	6	7	8
8	7	6	5	4	3	2	1

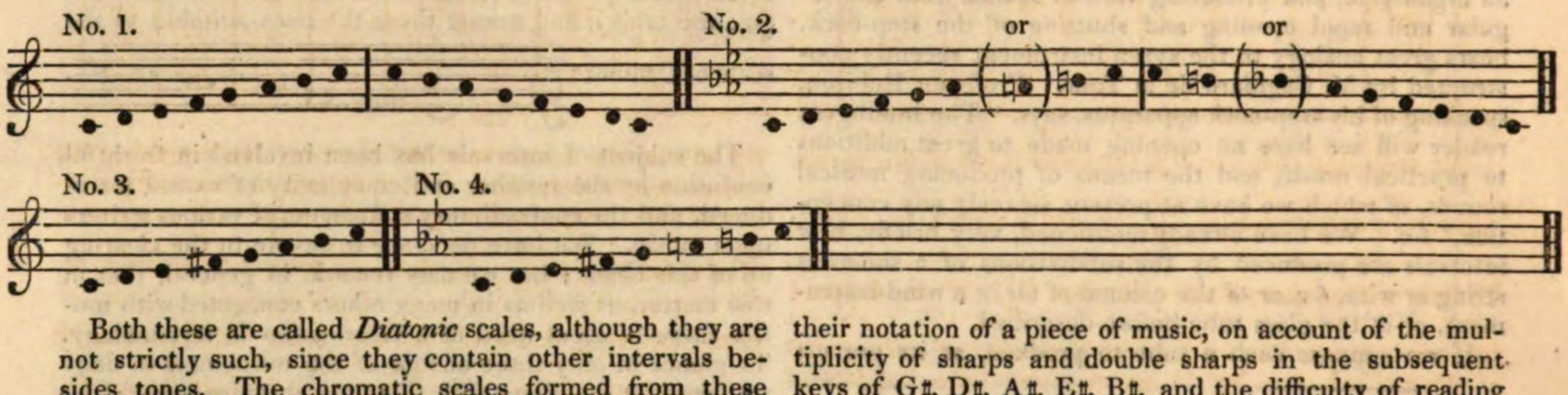
By looking at the above table of intervals, and their inversions, we perceive that *minor* intervals inverted become *major*, and *major*, *minor*; *diminished* intervals become *augmented*, and *augmented*, *diminished*. We have placed D♭ before C♯, and E♭ before D♯, and so on; because, contrary to the common opinion, the D♭ in the above series is a graver sound than the C♯, and the E♭ than the D♯, and so of the others. This is not easily understood by a mere player on the organ or piano-forte, but can be exemplified by any accomplished singer or violinist.

In writing for voices, especially in the strict or serious

Music. style, many of these intervals are not used. The following are generally prohibited in that style: Augmented second, diminished fourth, augmented fourth, diminished fifth, augmented fifth, major sixth, diminished seventh, minor seventh, major seventh, augmented third.

Musical scales, modes, keys.

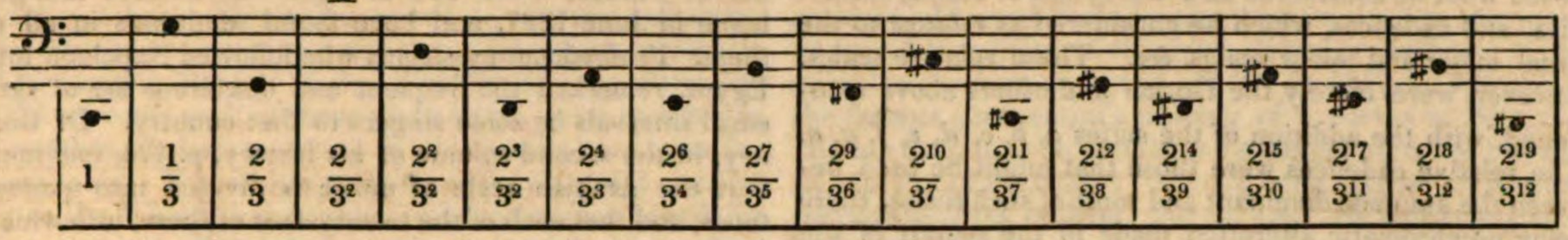
Scale is the more comprehensive of these terms, since all appreciable musical sounds between the extremes of grave and acute form the general scale or system of sounds employed in melody and harmony. A *mode* is a certain arrangement of tones and semitones, &c. between a given sound and its octave above or below. *Key* properly signifies a character employed at the beginning of the staff, to fix the names of the notes; but it has long been used as nearly synonymous with scale or mode, since these terms are often employed the one for the other. What is called the *key-note*, or *tonic*, is the principal sound of a mode, or that from which we begin to reckon its degrees upwards or downwards. Suppose we take the note C as *tonic*, or *key-note*. The arrangement of notes No. 1 will form the *mode* or *key* of C major, and the arrangement of No. 2 the *mode* or *key* of C minor. Music.



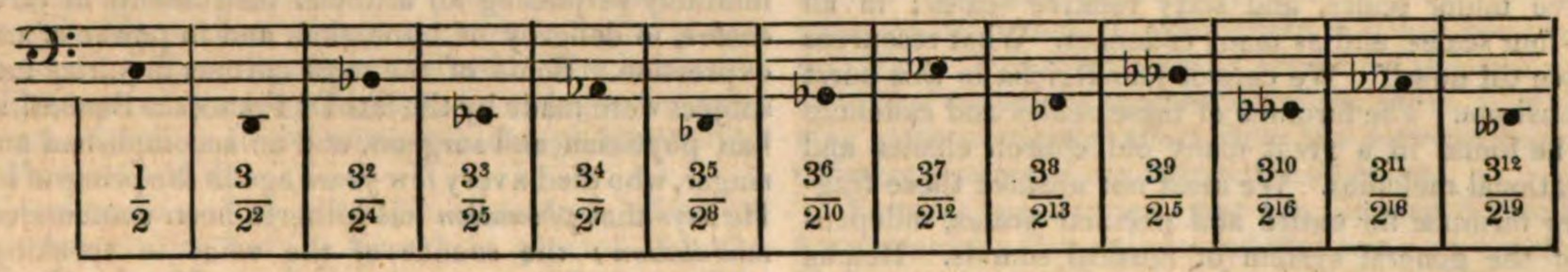
Both these are called *Diatonic* scales, although they are not strictly such, since they contain other intervals besides tones. The chromatic scales formed from these consist of a semitonic (or so-called semitonic) series between the key-note and its octave above or below, ascending or descending. These two modes, major and minor, and their respective chromatic scales, may be considered as the types or representatives of all other major and minor modes and chromatic scales. No. 3 and No. 4 are two forms of the major and minor mode not generally adverted to, but which are very effective when skilfully used, as, for example, by Haydn in the andantino in C minor of his symphony in E flat. As an octave series or scale may be formed anywhere within the limits of appreciable musical sounds, we thus obtain a variety of scales, diatonic and chromatic, all of which, however, are to be considered as only so many fragmentary formulæ, comprehended within, and belonging to the *whole series* of the general system. Thus we shall have the modes or scales of C flat, C sharp, major and minor; D major and minor, D flat and D sharp, major and minor, and so on with E, F, G, A, B, and their chromatic alterations, flat or sharp. The term *key* is usually applied to these. Thus we speak of the *key* of C major, of C minor, of C sharp major or minor, and so on. As concert-pitch is not one and the same in all countries, keys of the same name do not everywhere correspond exactly. The production of what is called the sharp series of keys arises from a regular succession of perfect fifths taken in ascending, or fourths in descending, beginning with C for the major ones, or A for the minor ones. Thus the first step of a 5th ascending from C brings us to G as a new key-note. G major, with one ♯ at the clef. The first step of a 5th ascending from A brings us to E as a new key-note E minor, with one ♯ at the clef. A 5th, again, ascending from G brings us to D major with two sharps at the clef; and a 5th ascending from E brings us to B minor, also with two sharps at the clef; and so on progressively with the major keys of A, E, B, with 3, 4, 5 sharps at the clef, till at last, at the twelfth 5th from C, we reach B sharp, which, when brought down by octaves towards the original C, will be found not to correspond with that C in unison or octave, but to be too sharp. The same thing will occur after a similar series of twelve perfect 5ths from A, as tonic of A minor, up to G double sharp, which last will not be in unison or octave with the original A, but will be too sharp in the same proportion as the other extreme of the series of twelve ascending 5ths from C to B sharp. We may mention here, that composers seldom go beyond the keys of F♯ or C♯ major or minor, in their notation of a piece of music, on account of the multiplicity of sharps and double sharps in the subsequent keys of G♯, D♯, A♯, E♯, B♯, and the difficulty of reading these, and of playing in tune in such keys upon musical instruments even of the most perfect kind.

What is called the flat series of keys, arises from a succession of perfect 5ths, the converse of the former. That is to say, when, beginning with C, or with A, for the major or for the minor series, each key-note, in regular succession, is a 5th in descending below, or a 4th in ascending above the key-note immediately preceding. Thus, from C to F in descending, F major with one flat at the clef; from this F to B♭ in descending, B♭ major with two flats at the clef; and so on with E♭, A♭, D♭, major, and with 3, 4, 5 flats, &c. at the clef. Then, again, the minor flat series, beginning from A as tonic of minor, D minor with one flat at the clef; from D tonic to G tonic of G minor, with two flats at the clef; and so on with C minor, F minor, B flat minor, &c. with 3, 4, 5 flats, &c. at the clef. We may here remark, that what is commonly called the relative minor key of a major key, has its tonic at the interval of a minor third below the tonic of that major key, and bears at the clef the same number of sharps or of flats. Thus the relative minor of C is A, without any sharps or flats at the clef; the relative minor of G is E, with one sharp at the clef; and so on with D major and B minor, A major and F sharp minor, &c. with 2, 3 sharps, &c. The same kind of relation occurs in the flat series of relative major and minor keys. Thus C major, A minor; F major, D minor; each of the latter two with one flat at the clef; B flat major, G minor, each with two flats at the clef; and so on with the rest, 3 flats, 4 flats, &c. The remoter flat keys beyond D flat are rarely used, for reasons similar to those assigned for the infrequent use of sharp keys beyond C sharp. To render more intelligible what has been said regarding the production of the sharp and the flat series of keys, we subjoin the following explanations. Suppose a musical string to render a sound equal to the lowest C of the violoncello, and to be numerically represented by 1. If this string be divided into three equal parts, any one of these parts will (tension and other circumstances remaining the same) render a sound equal to the first octave of the 5th above that C, and will be expressed by $\frac{1}{3}$. Two of these parts taken together will render the 5th above that C, and such 5th will be expressed by $\frac{2}{3}$, and will be equivalent to the lowest G of

Music. the violoncello. Taking, again, the length of the string represented by $\frac{2}{3}$, and dividing it into three equal parts, two of these parts will render a sound equivalent to D of second open string of violoncello, and this D will be expressed by $\frac{2^2}{3^2}$. By proceeding in the same manner, we shall obtain the series represented in the following diagram. With regard to the numerical expressions placed under the 5ths, it will be remarked, that at each successive 5th, the exponent of the number 3 increases by one, while that of the number 2 sometimes increases by one, sometimes by two, according as the new term is in the 5th above, or in the 4th below, the preceding one. Music.



We shall find that the B♯, the twelfth 5th of this series, will not be in unison with C$\frac{1}{2}$, the octave above the original C1, but will be more acute than that C$\frac{1}{2}$. If we suppose the whole string C1 divided into a number of parts equal to 2×531541, the B♯ in question will have 524,288 of these, while the C$\frac{1}{2}$ will have 531,541; and therefore the B♯ will be the acuter sound of the two. In reversing the process above described, that is to say, in reckoning a series of 5ths from acute to grave, the numerical expression of the 5th will be $\frac{3}{2}$. If, then, we set out from the C represented by $\frac{1}{2}$, and carry on, from acute to grave, a series of operations similar to the former, we shall obtain the following expressions for the flat series of keys by descending 5ths.



The D♭♭, the twelfth 5th from C$\frac{1}{2}$, will be found to be a graver sound than C1, the octave below that C$\frac{1}{2}$; for, supposing the whole string = C1 divided into 524,288 equal parts, the D♭♭ would require 531,541 of these parts, which exceeds the whole length of the string, and would therefore produce a graver sound than C1. The following diagram of the scales by 5ths ascending (sharp series), and by 5ths descending (flat series), will show the relative differences in pitch between the sounds of the one series and of the other.

Scale of Ascending Fifths.

C	G	D	A	E	B	F♯	C♯	G♯	D♯	A♯	E♯	B♯
$\frac{2^0}{3^0}$	$\frac{2^1}{3^1}$	$\frac{2^3}{3^2}$	$\frac{2^4}{3^3}$	$\frac{2^6}{3^4}$	$\frac{2^7}{3^5}$	$\frac{2^9}{3^6}$	$\frac{2^{11}}{3^7}$	$\frac{2^{12}}{3^8}$	$\frac{2^{14}}{3^9}$	$\frac{2^{15}}{3^{10}}$	$\frac{2^{17}}{3^{11}}$	$\frac{2^{18}}{3^{12}}$

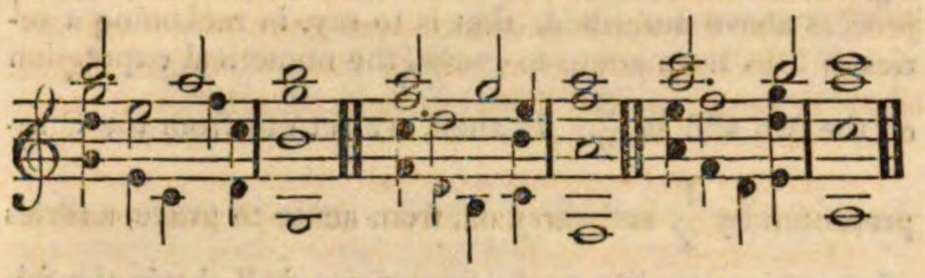
Scale of Descending Fifths.

D♭♭	A♭♭	E♭♭	B♭♭	F♭	C♭	G♭	D♭	A♭	E♭	B♭	F	C
$\frac{3^{12}}{2^{19}}$	$\frac{3^{11}}{2^{18}}$	$\frac{3^{10}}{2^{16}}$	$\frac{3^9}{2^{15}}$	$\frac{3^8}{2^{13}}$	$\frac{3^7}{2^{12}}$	$\frac{3^6}{2^{10}}$	$\frac{3^5}{2^8}$	$\frac{3^4}{2^7}$	$\frac{3^3}{2^5}$	$\frac{3^2}{2^4}$	$\frac{3^1}{2^2}$	$\frac{3^0}{2^1}$

If we compare with each other the corresponding terms of these two scales or series, we perceive that the sounds of the sharp series are more acute than those which correspond with them in the flat series, because the strings which produce the latter surpass the others in length by the difference between 524,288 and 531,541, = 7253. A slight consideration of these processes, and their results, will show the necessity of what is called *temperament* upon such an instrument as the organ, the piano-forte, &c. By it the fifths are rendered a little false, in order to obtain all the octaves true.

What are called the ancient ecclesiastical scales or modes, being, in reality, nothing but certain conventional scales or modifications of the common major and minor scales, and differing from these in nothing but the disposition of their semitones, it is not necessary here to notice them very particularly. The four most ancient of these were the Dorian, the Phrygian, the Lydian, and the Myxo-Lydian. The first of these was equivalent to the series *d*, *e*, $\widehat{f}$, *g*, *a*, *b*, $\widehat{c}$, *d*; the second to *e*, $\widehat{f}$, *g*, *a*, $\widehat{b}$, *c*, *d*, *e*; the third to *f*, *g*, *a*, $\widehat{b}$, *c*, *d*, *e*, $\widehat{f}$; and the fourth to *g*, *a*, $\widehat{b}$, *c*, *d*, *e*, $\widehat{f}$, *g*. The dif-

Music. ferent positions of the semitones is indicated by the curved line ⌒. The reader will find a full explanation of all the ecclesiastical modes, authentic and plagal, in the first part of the first volume of Padre Martini's *Saggio di Contrappunto*. A good many years ago, a Frenchman, Blainville, pretended to have discovered a new scale or mode, which was really nothing more than the Phrygian mode above indicated. Reicha, in his volume of thirty-six fugues, proposed what he considered as a *new system* of scales, harmonies, and cadences, which he considered as *relative* to the usual major and minor scales, &c. These relative scales, however, were merely the Dorian and others above mentioned, with the addition of the series *a*, *b*⌒, *c*, *d*, *e*, *f*⌒, *g*, *a*. The relative cadences were those that might be used between the assumed dominant and tonic of such scales, there being no chromatic alteration made in the sounds of the scale. For example:



Reicha says, enthusiastically, "according to this system, we should have two primitive scales, a major and a minor, and five relative ones; and, by transposition, twelve primitive minor scales, and sixty relative scales; in all eighty-four scales, and as many cadences. What resources unknown till now!" We cannot join Reicha in this burst of enthusiasm. The formulæ of these scales and cadences are to be found in a great many old church chants, and even national melodies. We must not mistake these fragmentary formulæ for entire and peculiar scales, independent of the general system of musical sounds. Reicha adds, "It remains for philosophers and men of genius at a future period to deduce all the consequences from this important system, as well as from the compound measures, and their use. But the subtilty of a conventional taste, the ignorance and the prejudices so fatal to the progress of the arts, and which are peculiar to narrow minds, will be long opposed to such deduction." We should rejoice if Reicha's anticipated deductions could be verified in our day; but, with all respect for that excellent musician, we rather think that he has too often suffered his reason to be led astray by the incomprehensible idealism and metaphysics, so general in Germany upon almost all subjects of art, science, and literature.

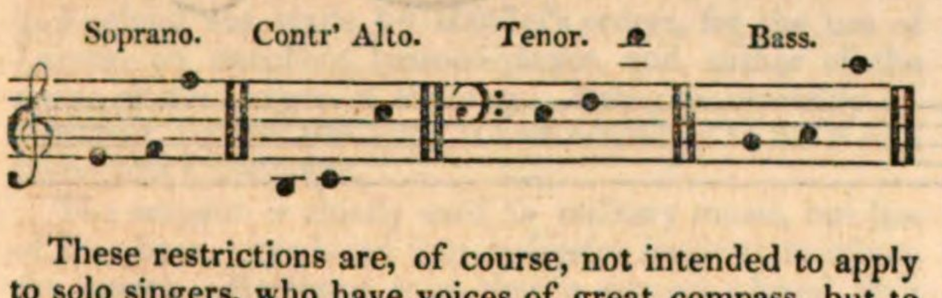
Some peculiarities that have been observed in certain national tunes, such as the omission, in some instances, of the fourth and seventh of the key, have been referred to scales of a particular kind, while it seems more reasonable to refer them merely to the imperfections of some of the musical instruments employed; for instance, the ancient flageolet, and the chalumeau, &c. Scales, seemingly anomalous, may arise from such causes, or from caprice, or conventional usage; but all such scales are only fragments of that general system of sounds which comprehends all manner of appreciable intervals, many of which last are much smaller than is commonly believed. It has been denied that the ancient Scotish music contained any semitones; but that this is an error, is proved by the Skene manuscript in the Advocates' Library, Edinburgh. In the ten Indian scales given by Sir William Jones, we find two that want the fourth and seventh of the key note, and one that wants the third and seventh. The former are the scales called *Máravi* and *Gaudi*, equivalent to *c*, *d*, *e*, *g*, *a*, and *g*, *a*, *b*, *d*, *e*; the latter is the one called *Saîndhavi*, equivalent to *a*, *b*, *d*, *e*, *f*. The *Asávéri*, *Bahairava*, and *Malava*, correspond exactly with the Dorian, the Lydian, and the Myxo-Lydian modes above mentioned. The *Friraga* is the same as the *Malava*, the *Todi* is the same as our scale of C major, and the *Varati* and *Bengali* correspond with our scale of A minor with minor seventh. As to the Hindu, Persian, and Chinese scales, and the use of quarter tones, or other minute intervals, we refer the reader to what we published on that subject in No. iv. of the New Edinburgh Review, April 1822, pp. 521–528. We have examined a number of Chinese wind and stringed instruments brought home in June 1837, and have found semitones in all of them. Professional musicians who followed Napoleon into Egypt, remarked the frequent and dexterous use of very small intervals by some singers in that country. Dr Burney, in the second volume of his history, p. 424, mentions that the Arabian scale of music is divided into quarter tones, and that each of the twenty-four of these, into which the octave is divided, has a particular denomination. Music.

At the head of these must be placed the human voice. The nearer any artificial instrument approaches to it in quality and power of expression, the more excellent it is. Much controversy has arisen regarding the mechanism of the vocal organs which effect the modulations or inflexions of the human voice in singing. Some physiologists have considered this mechanism as similar to that of a reed instrument; others as similar to that of a stringed instrument. It is indeed neither, according to our artificial instruments, but a mechanism of wonderful delicacy and complexity, infinitely surpassing all artificial instruments in variety of *timbre*, in delicacy of intonation, and in power of melodic expression. Some of the most curious inquiries into this subject were made by the late Dr Francesco Bennati, an Italian physician and surgeon, and an accomplished amateur singer, who died a very few years ago in the prime of his life. He says that *phonation* has hitherto been confounded with *modulation;* the sounds of the voice in speaking, &c. with those of the voice in singing. We would observe, that the ancient Greeks, in their writings on music, made a marked distinction in this. Dr Bennati says that the muscles of the larynx are by no means, as hitherto asserted, the only ones employed in the production of the sounds of the human voice in singing; and that from leaving out of view a number of elements which belong to the real mechanism in such production, the theories of the whole matter that have been proposed and received are erroneous. Among these omissions of real elements, he instances the muscles of the *os hyoïdes*, of the *tongue*, of the *upper anterior* and *posterior part of the vocal tube*, besides other anatomical parts that contribute to modify the voice. We cannot here enter into the curious details given by Dr Bennati; but may add, that he rejects the received terms of *note di testa* and *note di petto*, as conveying false ideas; and proposes to substitute for them the terms *supra-laryngean* and *laryngean* notes or sounds. His proofs of all that he asserts are drawn from his own frequent observation of the actual functions of the whole mechanism of the voice in the cases of a number of the most celebrated male and female singers, his contemporaries. Stretched strings of gut or silk, either plain or spirally covered with wire, are the sonorous bodies employed to produce musical sounds on instruments of the violin kind, or of the guitar kind, or on the harp. Stretched wires of brass or steel, &c. plain, or spirally covered with wire, produce the sounds of the pianoforte, &c. Other instruments are constructed of glass bells or rods, &c. made to sound by friction or percussion; others, again, of metal springs, made to sound by a revolving toothed barrel, as in the Geneva musical boxes; or by a current of air directed against them, as in the German toy called the mouth harmonica, or in the Æolophon, or the Accordion and Symphonion. Several other instruments of a similar kind were invented before these. It Musical instruments.

Music. may be mentioned, that Professor Robison of Edinburgh University gave the hint for constructing instruments of this last kind.

In the year 1785, the Abbate Gattoni constructed at Como a most singular Æolian harp. He stretched fifteen iron wires, of different thicknesses, from the top of a tower fifty-two *braccia* in height (about ninety feet), to his dwelling-house, about 150 paces distant. This giant-harp, by its mysterious sounds while the air was calm, indicated changes of the weather. This was ascribed to electric influence. The same phenomena occurred in a similar harp constructed by Captain Haas of Basle. The effect of the vibrations of the wires in each of these giant-harps, prior to changes of weather, or during storms, is said to have been quite indescribable. The sounds swelling and dying, and combining in the wildest harmonies, were sometimes heard for miles around. Wind instruments are tubes of wood or metal, in which the vibrating body is the column of air contained in them. They are sounded either by a peculiar mouth-piece, like that of the old flute or the flageolet; or by blowing into an aperture on one side of the tube, as in the fife, german flute, &c.; or by means of a reed, as in the oboe, clarinet, bassoon, &c.; or, as in the case of the horn, the trumpet, &c. by means of a cup-shaped mouth-piece, to which the lips are applied in a particular manner, and the sounds produced by compressions and dilatations of the lips, and the regulated force of the breath, and, in some circumstances, by introducing the hand within the bell-shaped end of the instrument. Other instruments are merely pulsatile, such as triangles, cymbals, bells, gongs, drums, &c., and have their sounds fixed. The harsh and unmusical tone of the gong seems to be owing to its peculiar shape, as well as to the numerous abrupt inequalities in its thickness and density.

With reference to Choron's table of compass of voices and instruments, we have to remark in general, that the best sounds of voices and instruments are their medium sounds, and that this ought to be carefully attended to by the composer. The frequent neglect of this in modern compositions produces a detestable chaos of screaming, squeaking, and grumbling. We add the following supplementary and explanatory information, which is of importance to the student. The medium compass of voices is as follows:



These restrictions are, of course, not intended to apply to solo singers, who have voices of great compass, but to Parts[1] written in songs, duetts, trios, &c. for voices of ordinary compass. It should be kept in view, that in writing for voices of the *same* compass and quality, we can hardly go beyond a trio or a quartett without producing a poor effect. Duetts, or at most trios, of this kind, are therefore best when circumstances require such combinations. But, for *variety* of effects, and freedom of harmonic combinations, three, four, or more voices of different compass and quality ought almost always to be preferred in vocal trios, quartetts, &c. For *duetts* of this contrasted kind, see the operas of Cimarosa, Mozart, Cherubini, Himmel, &c. To write effective Parts in harmony for voices, requires great skill and judgment. In a vocal quartett, for example, if we throw any of the voices out of their best medium compass, and do not carry them all on in correspondence with Music. that compass, we shall produce poor and ineffective harmonies; for instance, if we place the tenor Part too low and too near the bass, while the treble and contr' alto remain in their best medium compass. Again, we may render the principal Part in a soprano a secondary Part (to the ear), by bringing it and the contr' alto too close to the tenor and bass; and may thus render the tenor, or even the bass, the most prominent Part, when we intended the contrary. In vocal Parts for many voices, such as choruses, &c. great simplicity of structure and of *performance* is required to produce any good effect. In 1819 we witnessed the famous Crescentini's training of a chorus at Bologna. His ear caught in an instant the slightest defect of intonation in any of the voices; the slightest excess of disproportionate *piano* or *forte;* the slightest attempt at any embellishment, even an *appoggiatura*. He stopped the whole performers immediately, pointed out the fault, and made them repeat the music over and over again till he was satisfied. This was the true way to train a perfect choral band; it would be well if his example were followed in all such cases.

Its powers and compass as a solo instrument are very Violin. great, although too often misused. In orchestra music it is seldom carried above F in alt.

In writing for an orchestra, the viola is rarely used Viola. above G, two octaves and a fifth above its lowest sound C. Not unfrequently, in modern music, it crosses the second violin, and rises above it for a short time in the harmony of a quartett, even where it is not performing a solo Part. But this generally occurs for the sake of preserving a melodious progression of the Parts, or of producing some particular effect from the *interweaving* of the different *timbres* of the stringed instruments.

We must keep in view, that the German double basses Double have generally four strings, and that some are tuned E, A, basses. D, G, upwards, while others have D for their lowest note. In Italy and France the double basses have only three strings, and are tuned A, D, G. In writing for the double bass, rapid passages ought to be avoided, because they produce no effect, but only a confused noise. In music for a full orchestra, the double basses are reinforced by the tenor violins and violoncellos, or by the bassoons; or by the trombones, serpent, &c; sometimes by the horns and trumpets, by the lower notes of the clarinet or of the oboe, even by the flute in its upper octaves, or by the octave flute, though the latter combinations are often abused by some living composers. Sometimes, in a florid passage for the double bass, a good effect is produced by reinforcing it by the second violins. In orchestra music, Violon- the violoncello generally goes (an octave above) with the cello. double bass Part: but beautiful effects are often produced by giving the violoncello a principal melody, accompanied by other instruments. When the treble clef is used in passages for the violoncello, care must be taken to write them according to the real pitch of the sounds, and not an octave higher, as is too often done.

In writing for the German flute, all rapid passages in Flutes. keys having more than one or two sharps or flats should be avoided, as they are very difficult of execution. We have corrected Choron's table, by extending the compass of the flute to C downwards, as most flutes now have the C finger-key. Its compass upwards is to B flat on the fifth ledger line in alt. In modern orchestra music, the octave flute, or *piccolo*, is too much employed. Its shrill and piercing sounds ought to be reserved for particular effects. In military music there are other kinds of flutes used,

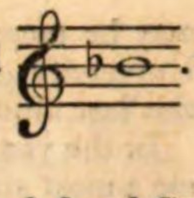
[1] In this article, we use the word Part, beginning with a capital, to signify that portion of a musical composition assigned to a particular voice or instrument.

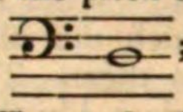
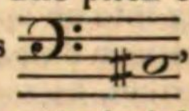
Music. the *piccolo* in E flat, and the *piccolo* in F; the former being a semitone higher, and the latter a minor third higher, than the octave flute. There are also what are called third and fourth flutes, the former being a minor third, and the latter a fourth, higher than the common German flute in D. Parts for these flutes are written in D. There are five sorts of flageolets, in C, D, E flat, F, and G, for the sake of facilitating their performance in different keys. Double and even triple flageolets have been contrived in London by Mr Bainbridge. On the former, two parts can be played at once; on the latter, three. The oboe requires attention in writing for it. The easiest scales for it are C major, F major, G major, and D major. In some modern oboes, there are, in the upper part of the instrument, finger-keys for F and A flat; and, in the middle part, for F sharp, E flat, and C. Some have a finger-key for the lowest C sharp. Some players have two or three upper and middle pieces, to serve for altering the pitch of the instrument to different keys, on the same principle as flutes and clarinets, &c. are made of different lengths to avoid difficulties of fingering. In orchestra music the oboe is not used beyond E flat in alt.

Flageolets.

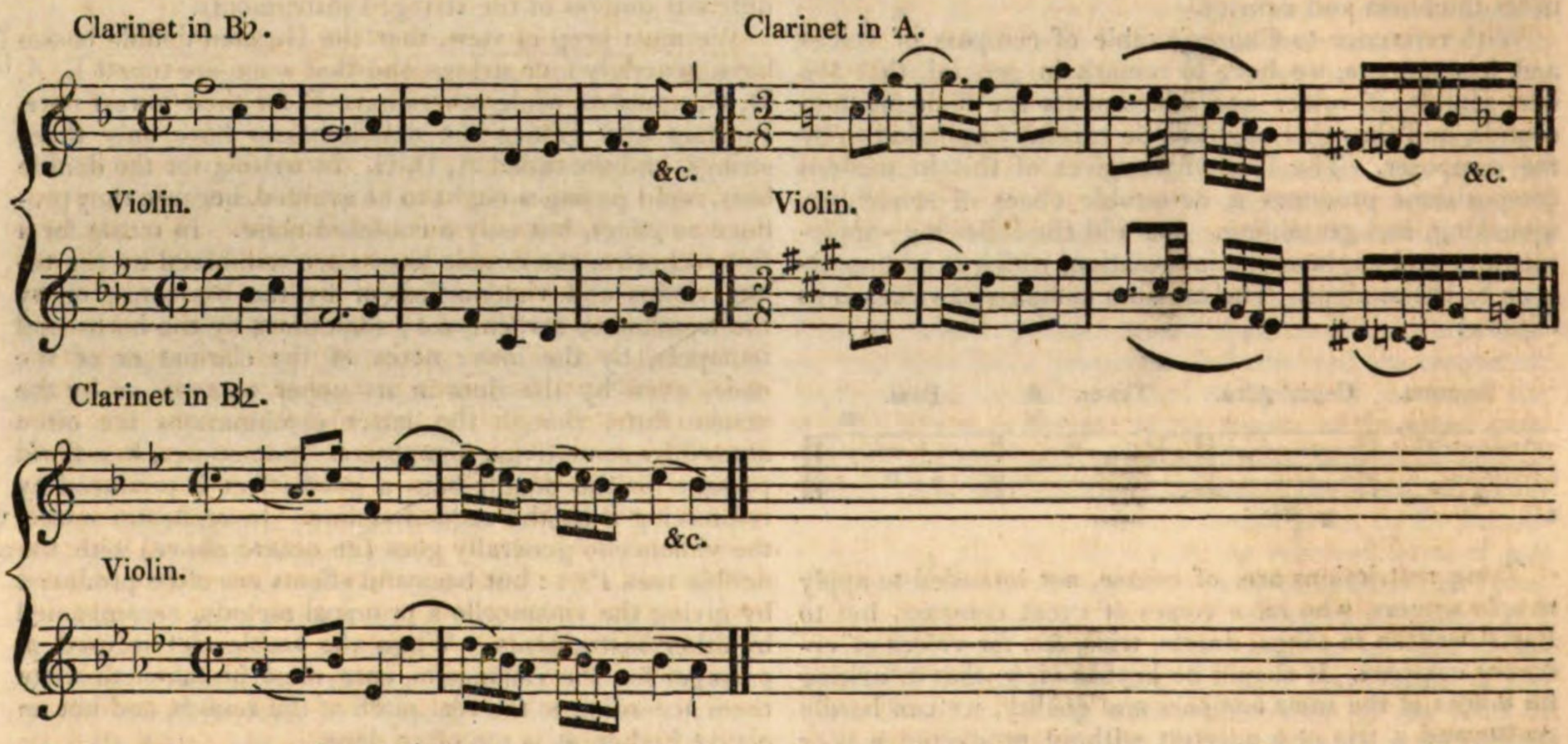
Oboe.

English horn. The English horn, or *vox humana*, is an instrument of the oboe kind, having the same relation to the oboe that the viola has to the violin. It has the same number of sounds as the oboe, only the scale is a fifth lower; so that pieces of music in F are written in C for the English horn, pieces in E flat are written for it in B flat, and so on.

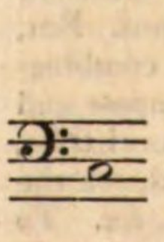
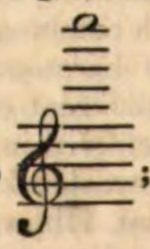
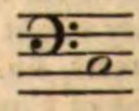
Clarinet. The clarinet, or clarionet as it is often called, is an instrument of great power and compass. We have corrected Choron's table, by extending its compass upwards to C above fifth ledger line in alt. The sweetest sounds of the clarinet are comprised between and  . Music.

The sounds between B on third line of treble clef and C♯ on second ledger line above are the most penetrating and brilliant. The sounds above that C♯ are very difficult to produce without harshness of tone. It requires great skill to play in tune on this instrument, particularly in the lower part of its compass. On this account, as well as to avoid difficult fingering, clarinets of different sizes are used to suit different keys. The most common used in orchestras are those in C, in B♭, and in A. Besides these, there are used, in military bands, clarinets in D, E♭, F, and G. These changes alter the pitch of the instrument, but the fingering remains as before. Thus the pitch of a B♭ clarinet becomes in its lowest sound  ; that is, a tone lower than the C clarinet. The pitch of the A clarinet in its lowest sound becomes  , and so on.

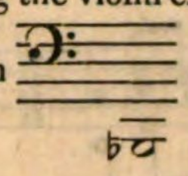
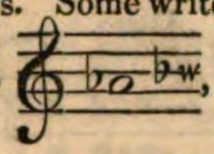
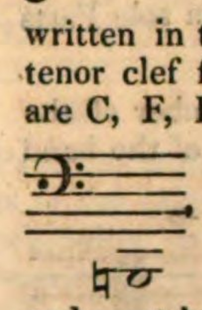
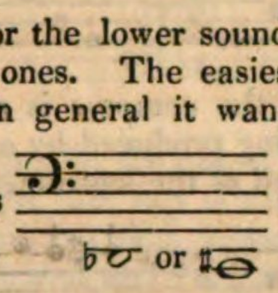
It is the custom to consider the principal key of every clarinet, whatever that may be, as if it were C. The composer must attend to this in writing for the clarinet. The B♭ clarinet serves to lessen the number of flats at the clef, and the A clarinet to lessen the number of sharps, and so of the others. When the piece of music is in E♭, the B♭ clarinet plays in F. The A clarinet plays in C when the piece is in A. If the piece is in A♭ the B flat clarinet plays in B♭, and so on. An example or two will make this rather puzzling matter more clear.



A few years ago, a German instrument-maker invented a bass clarinet and a double-bass clarinet. The former is an octave lower than the C clarinet, and reaches B♭, the lowest note of the bassoon. The double bass clarinet has a compass of two octaves and a half upwards from the lowest F in bass clef. It therefore extends to a fourth below the bassoon. The union of these with common clarinets permits the formation of a clarinet quartett, and, of course, new orchestral effects.

Basset-horn. The basset-horn is an instrument of the clarinet kind, although differing in form from a clarinet. Choron has omitted it in his table. As it is sounded and fingered like a clarinet, any clarinet-player can play upon it also. It holds a middle place between the clarinet and the bassoon. Some authors give it a compass of four octaves from  to  ; others a compass from  to . As it is an instrument difficult to manage, it is generally confined to the keys of C, F, B♭, and G. Mu-

Music. sic for the basset-horn is written in the treble clef, and a fourth or a fifth higher than the real sounds, except in the case of arpeggios, &c. in its lower octave, which are expressed in the bass clef. For instance, if the music is in G or in F, the part for the basset-horn will be written in C. For examples of its use, see Mozart's *Requiem*, his *Figaro*, his *Clemenza di Tito*, and his *Die Enführung aus dem Serail*. It is too much neglected in orchestra music.

Bassoon. The bassoon is an instrument of the oboe kind, though it differs from the oboe in shape and construction. It holds the same place among the oboe class of instruments as the violoncello does among the violin class. Some writers state its compass to be from  to  , or even to among solo-players. Music for the bassoon is written in the bass clef for the lower sounds, and in the tenor clef for the higher ones. The easiest keys for it are C, F, B♭, and G. In general it wants the sound  and the sounds  are very bad, and must be avoided.

Of late years, some bassoon-players and instrument-makers have facilitated the execution of certain passages on that instrument by a new disposition of the finger-holes and the finger-keys. In orchestra music, bassoons are important instruments. They serve as a bass to the flutes, oboes, clarinets, and horns; they may fill up and enrich the harmony of the middle parts; they may go along with (in the octave or the unison, as may suit) and reinforce the double bass, the violoncello, the viola, the violin, the clarinet, the oboe, the flute, the horn; or they may perform solo passages of their own with great effect. Composers seldom put the bassoons to their proper and effective use, but too often make them a mere reinforcement to the other bass instruments.

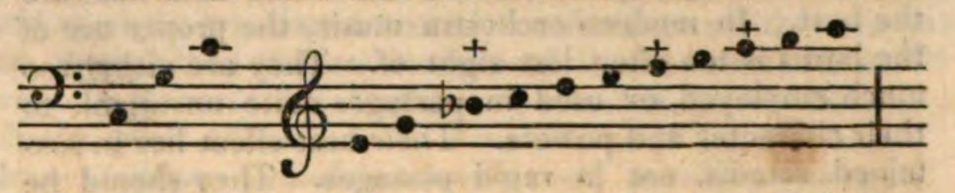
Bass-bassoon. The bass-bassoon (fagottone or contra fagotto) is an octave lower than the common bassoon. It is not mentioned by Choron in his table. The first bass-bassoon seen in England was made by Handel's orders, for the use of Lampe, an excellent bassoon-player, and author of the music of the Dragon of Wantley. Being an unwieldy instrument, sixteen feet long, it was necessary to fix it in a frame like a telescope.

Serpent. The serpent is chiefly used in military music, but has of late been introduced into orchestra music to reinforce the basses. Mersenne says that a serpent played by a boy was sufficient to sustain the voices of twenty stout monks. Of late years some improvements have been made on it by the addition of keys, though it is still an imperfect instrument. Writers differ in the compass assigned to it. Some give it a compass from the lowest B flat of the pianoforte, up to G on the second line of the treble clef, with all the semitones. Others state its compass to be from lowest C of violoncello, up to C in third space of the treble clef. One eminent writer says that its compass is four complete octaves; that is, from C an octave below the lowest C of violoncello, up to C in the third space of the treble clef. He says the lower notes, in this last compass, are very difficult to produce, and their intervals not easily appreciable. Reicha assigns to it a compass of three octaves, viz. from lowest C of violoncello, up to C in third space of treble clef. The safest compass for ordinary players is the two first of these octaves only, leaving out the highest of the three. It is a singular fact, that there exists at this day, even among many professional musicians, a great deal of misconception regarding the real compass of a number of musical instruments of the wind kind. We have often been surprised to find that a performer upon a horn, for instance, did not know its real pitch or compass, and that he even supposed these to be just what appeared from the notation in the treble clef. Now, a C horn, for example, is a tube of eight feet or so in length; and, when played upon, becomes a tube stopped at *one end* by the lips, and therefore may render, as its lowest possible sound, one equivalent to that produced by an organ-pipe of sixteen feet open at both ends; that is to say, = C an octave below the lowest C of the violoncello. The serpent, if a tube of the same length, will, when played on with all the finger-holes stopped, be in a condition to render (but, like the horn, with great difficulty) the same low C as the horn.

Music.

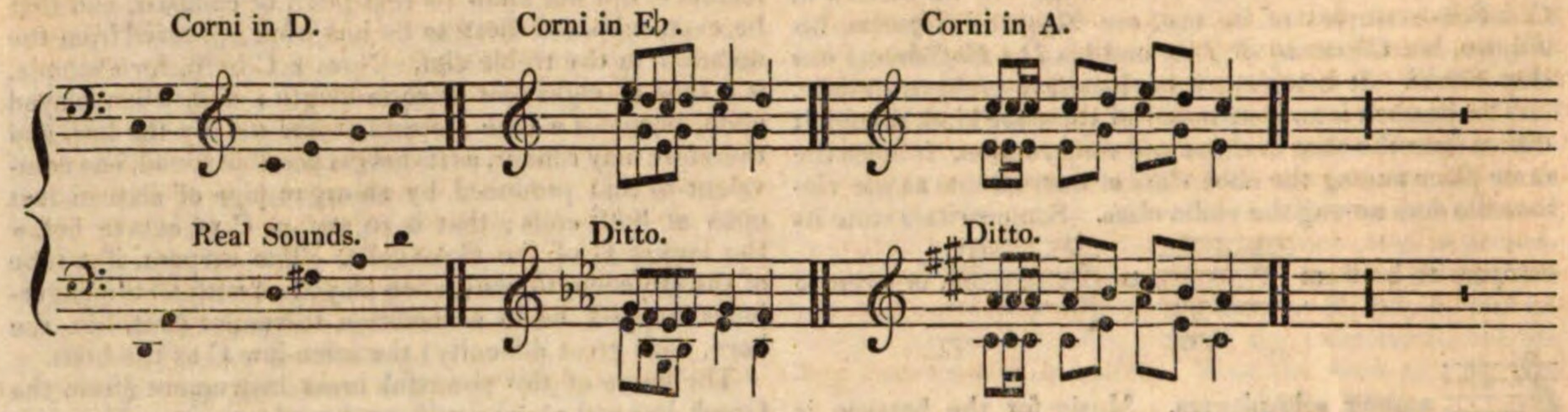
Ophicleide. The name of this powerful brass instrument (from the Greek ὄφις and κλείς) signifies a keyed serpent. The ophicleide was invented a few years ago in Germany. It was at first used in military music only, but of late years has been introduced into orchestras. It is too noisy an instrument for any place but a large locality. There are several kinds of ophicleides, as of trombones, and music for the former is written in the same manner as for the latter. Examples of the judicious use of the ophicleide may be seen in the *Gloria* and subsequent movements, and *Marche Réligieuse* of Cherubini's third solemn mass performed at the consecration of Charles X.

Horn (Ital. *Corno.*) Whatever may be the key of the piece of music in which horns are employed, their Parts are always written in the key of C. The following is the harmonic progression of sounds producible by the horn, without any assistance from the hand introduced into the bell.

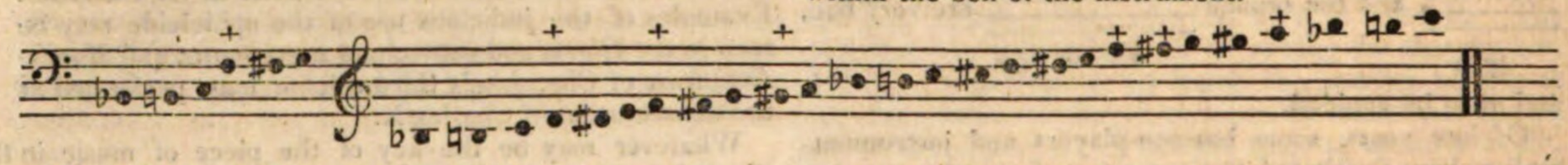


The sounds marked + are, successively, = to B flat, harmonic; G flat, ditto; and G sharp, ditto. See preceding section, *Musical Sounds and Intervals*. We may here remark, once for all, that the sounds called false and bad on the horn, trumpet, &c. such as the pseudo fourth and sixth and flat seventh of the scale, are *true* as *chromatic* harmonics, but do not correspond with the sounds found in the same nominal places in the *diatonic* scale. In treating of harmony, it will be seen that these same chromatic harmonics—called false sounds from their not belonging to the diatonic series—are frequently employed in modern harmony and melody. The dominant seventh continually occurs, and less frequently the diminished fifth and the augmented fifth, which are the other two harmonics in question. It must be observed, that if a horn in C, of eight feet tube, performs the above notes, the real sound of each is an octave lower than the notation indicates. Of late years it has been attempted to remedy the imperfections of the horn, and to render it capable of playing in a variety of different keys without difficulty. This was so far done in Italy in 1822, by means of eight finger-keys, and a sliding tube to regulate the pitch; but this improvement has not been generally adopted. Some German instrument-makers have also contrived stops, to be pressed down by the fingers, which are said to answer much better than keys. They have also applied these stops to trumpets and trombones. This has also been done in England. We shall consider only the common horns, as they are still used in some orchestras. The method generally adopted to alter the pitch of a horn, is to shorten or lengthen its tube by means of moveable bent tubes called *crooks*. In some few cases, horns of different sizes are used instead. Thus there are horns in C, in D, in E flat,

Music. in E, in F, in G, in A flat, in A, in B flat, and even in C above. There are two B flat horns, the one an octave lower than the other. The lowest B flat horn goes a tone lower than the lowest C of the C horn. In writing for the horn, it is necessary to mark, at the beginning of its Part, for what key it is intended, as in the following examples. The Italian word *corni* (horns) is generally used in partitions. Music.

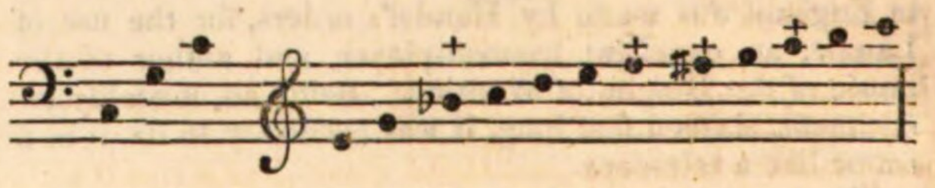


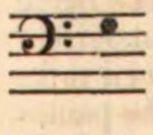
In general, in writing for an orchestra, there are two horn Parts, the first of which does not (by *notation*) go lower than the lowest C in the treble notation, and the second one not higher than E in the fourth space of treble clef. The compass is generally limited to the following sounds, But in solo Parts for the horn, the compass is as follows, a number of the semitones being produced by a dexterous use of the hand within the bell of the instrument.

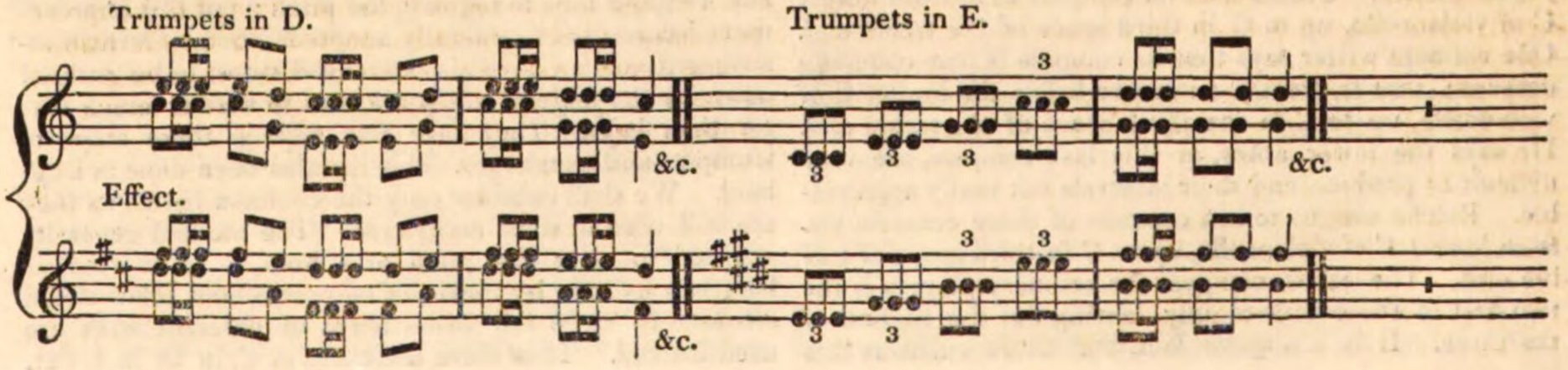


The notes marked + may be used in passages of some quickness, but should never be sustained. The sounds of the middle part of this compass, or at least from G on second line of treble clef to G above the fifth line, are the best. In modern orchestra music, the proper use of the horns is too often lost sight of. They are either too much employed, or used in passages quite unsuitable to their character and powers. Their best effect lies in sustained sounds, not in rapid passages. They should be used to enrich the harmony in proper places, or to sustain a principal melody, or to produce contrast by their solos judiciously introduced. By using at once three or four horns tuned to different keys, a number of rich and beautiful harmonic effects have been produced by modern composers. As the sounds of the middle compass of the horn are the best, judicious composers for that reason often make use of horns in a key different from that of the piece of music in which these take part. Sometimes, but rarely, we find horn Parts written in the bass clef, as more truly representing the compass of the instrument; but it is better to avoid difficulty in reading such notation, by conforming to the usual practice of writing horn Parts in the treble clef. Skilful horn players expend but little breath on their instrument, and thus produce its finest tone. Others not only exhaust themselves by strong blowing, but produce a harsh tone, and fill the tube with water from their condensed breath. This water contributes to spoil the quality of the tone, and to break it into gurgling sounds.

Trumpet. Trumpets in the keys of C, D, and E♭ are those most commonly used; but there are also trumpets in A, B♭, E, F, and G. It must be observed, that in some of these, F and G, for example, the gravest sounds are very difficult to produce. Some very skilful performers execute all sorts of passages on the trumpet; but, in writing for an orchestra, we ought not to go beyond rapid passages of double or triple tongueing upon a reiterated sound, or certain arpeggio passages. The trumpet may be either played softly, like the horn, or loudly with tongued passages, as in military music. To perfect the trumpet, finger-keys have been applied to it by some makers, and a sliding tube by others. Whatever the key of the music, the trumpet Part is written in C. The pitch of the trumpet is an octave higher than that of the horn. Its natural scale is



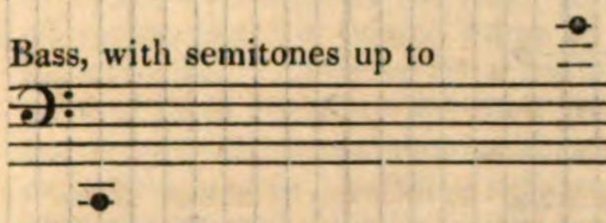
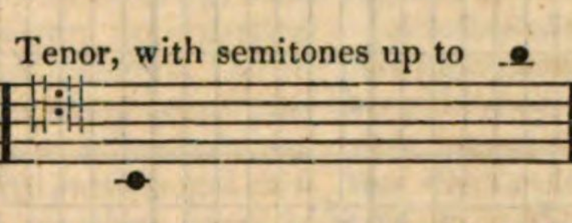
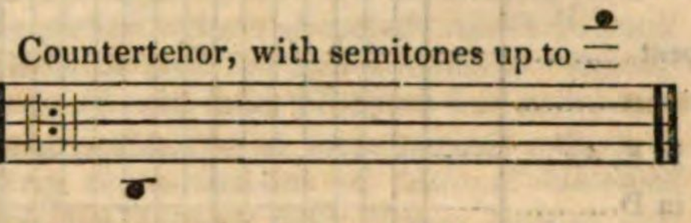
The notes marked +, like those of the horn, do not correspond with the diatonic series, and should not be used in sostenuto passages. The best notes are from  up to , and those higher had better be avoided.



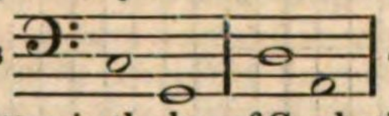
Music. Trumpets, as well as horns, may be muted by introducing a pasteboard tube into the bell of the instrument. The sound then becomes extremely feeble, and the pitch is lowered a semitone. By using two trumpets in different keys (as in the case of horns), a number of harmonic combinations in minor keys may be introduced which could not otherwise be effected; also by combining together two or more horns in one key, with two or more trumpets in another. The penetrating and warlike sound of the trumpet renders it very effective in pieces of military music, and in music expressive of heroic or exulting feelings.

Trombone. The trombone is a most powerful and effective instrument, but very difficult to manage correctly. In Italy the bass-trombone only is used; but in France, Germany, and England, there are three kinds of trombones, the bass, the tenor, and the counter-tenor. There is also a *double-bass trombone*, which goes a fifth lower than the common bass-trombone, but is not much used. The treble trombone is very rarely used; and it is better to add to the three former another counter-tenor trombone when four trombones are to be employed, than to add a treble one. In the performance of solemn, religious, or warlike music, the combination of three or four trombones produces a great effect; for instance, in the statue scene in Mozart's *Don Giovanni*, where the supernatural voice is accompanied by three trombones, two bassoons, two clarinets, and two oboes. The effect of the chant so accompanied is terrific. Mozart borrowed the idea from that passage in Gluck's *Alceste*, where the voice of the oracle of Apollo is heard in the temple.

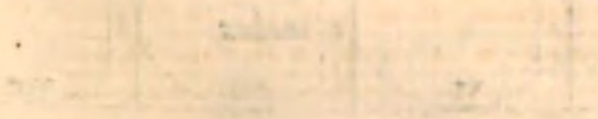
Scales of Bass, Tenor, and Countertenor Trombones.

Bass, with semitones up to  Tenor, with semitones up to  Countertenor, with semitones up to 

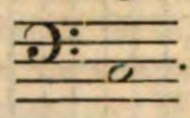
Parts for trombones are written in the above clefs; and, as in the case of bassoon Parts, the key is marked at the beginning, or accidental sharps or flats introduced when required. It is to be noticed, that there are trombones in different keys, for different purposes: in F, C, G. Sustained sounds are most suitable to the trombone, especially in orchestral combinations. A very few players are so skilful as to be able to execute very difficult solos on the trombone; such as Schmidt, who performed on it in London in 1829. The trombone can be *muted*, like the horn or the trumpet, and then its effect in funereal music becomes very striking. Chromatic passages ought, in general, to be avoided on this instrument.

Kettle-drums. Kettle-drums, called *Timpani* in Italian, are tuned to various keys, as occasion requires. They are generally in pairs; one of them sounding the key-note of the music, and the other the 4th below, as  &c.

The Part for them is always written in the key of C, whether the key of the music be C or not; but if it be another key, this is marked at the beginning, as

Drums in D. Drums in E♭.  &c. It has been proposed to introduce into orchestras three drums tuned to different sounds; and perhaps there might often be advantage in this. We have seen a vocal and orchestral composition for forty voices and forty-two instruments, in which eight kettle-drums were employed. They were to be played by four persons, and were tuned thus: from G upwards, A flat; A, B flat; C, D flat; D, E flat.

The *roll* of these drums, when executed *piano*, has a sombre and mysterious effect. It is usually marked *tr*..... or 𝆒 over the notes. Clarinets, horns, trumpets, and drums, may be changed for others in the course of a piece of music, provided a sufficient number of bars of rest are given.

Bass-drum. *Tamburone* in Italian, or vulgarly *cassa grande*. This is a very large drum, of the usual cylindrical shape, and is used chiefly in military bands, but occasionally in great orchestras. In Haydn's symphony, called the *Surprise*, it is used with startling effect. Its Part is written in the bass-clef thus:  .

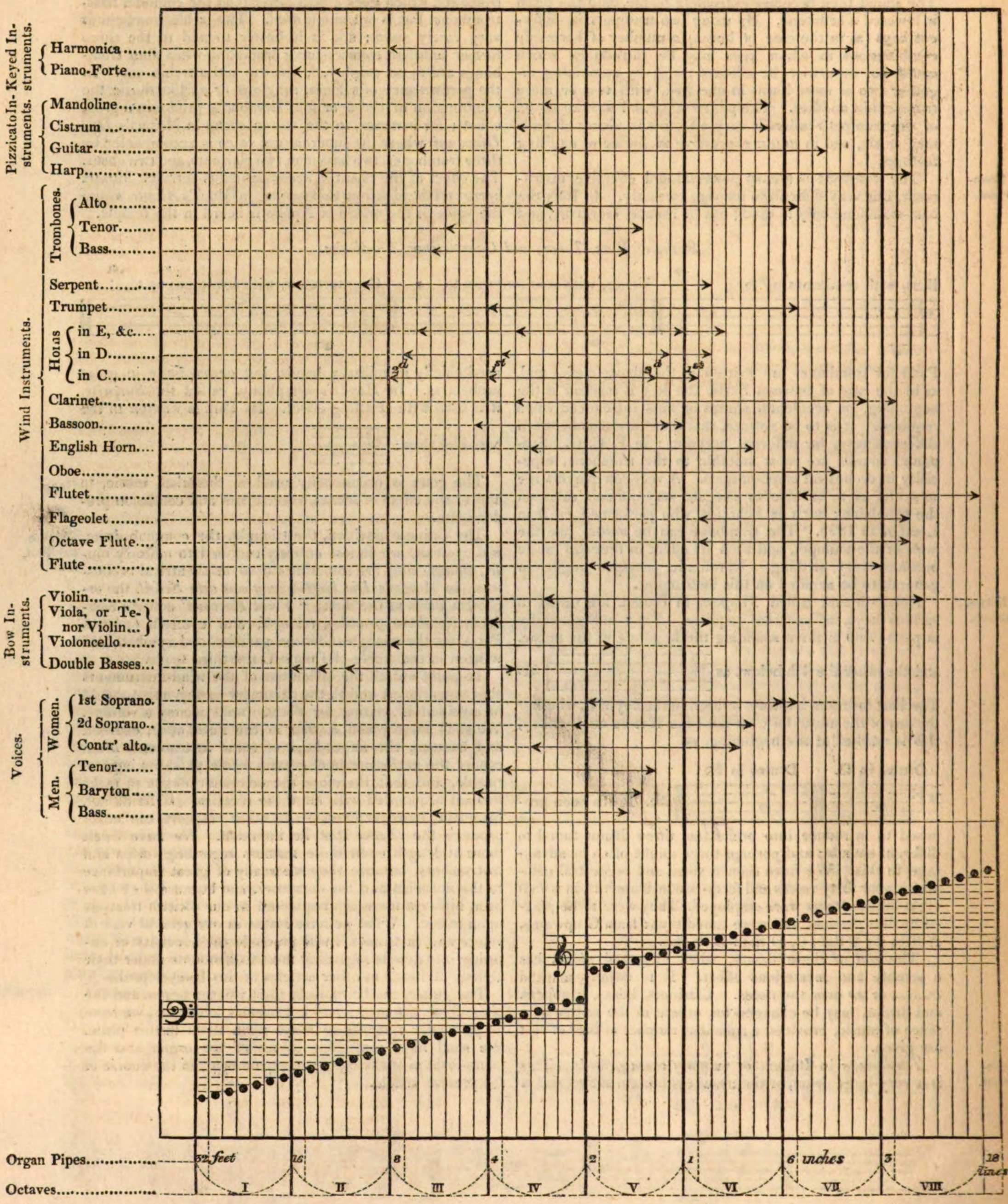
Gong. The gong is occasionally used in theatrical music, to add to the effect of scenes where terror and confusion predominate.

Chinese pavilion, &c. The Chinese pavilion, the triangle, the common drum, and cymbals, are almost entirely confined to military music, though they are sometimes used in theatrical orchestras. In Mozart's *Die Entführung aus dem Serail*, the orchestra Parts of the duett "*Vivat Bacchus*" contain bass-drum (*tamburo grande*), *triangle*, and cymbals (*piatti*). Parts for the triangle, Chinese pavilion, and cymbals, are written in the treble-clef upon C the third space.

To point out all the difficulties of the wind-instruments above mentioned, and all the particular passages that should be avoided in writing for them, would occupy a volume. We shall merely notice, that in the flute, oboe, clarinet, and bassoon, the finger-keys of these instruments often render the performance of certain *legato* passages impracticable, and that therefore the composer ought to make himself acquainted with all these niceties. If he do not, his music, however excellent in other respects, can never produce the effects that he intended. We have dwelt more at length upon these matters regarding voices and instruments, because they are really of great importance to the musician and the composer, and because they have been hitherto too much neglected in our British treatises upon music. What we have stated in our general view of voices and instruments will preclude the necessity of entering into details regarding most instruments under their alphabetic heads in other articles of this Encyclopædia.

The guitar, the harmonica, the harp, the organ, and the piano-forte, are mentioned in Choron's table; but we have no particular remarks to make upon them in this place. We shall have something to say of the organ and the piano-forte in speaking of accompaniment, in the course of the present article.

Table of the Compasses of Voices and Instruments.



Music. Melody.

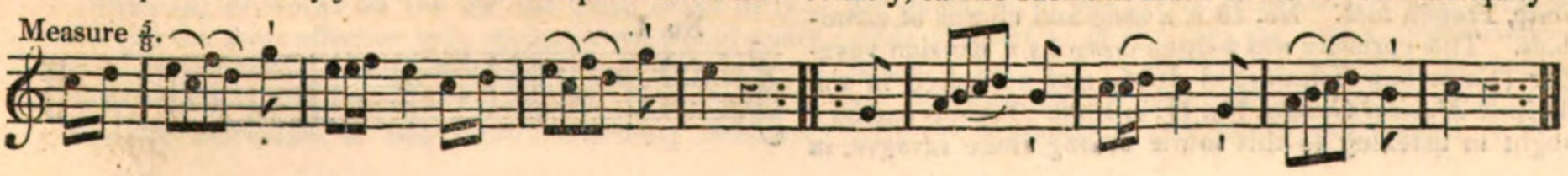
Melody may be considered in relation to a single voice or instrument, or as accompanied by one or more voices or instruments. In the latter case it is called the principal melody. There are many simple and expressive melodies, of such a kind that they will hardly bear any accompaniment without injury to their effect. Too often such melodies are spoiled by the addition of crowded and elaborate accompaniments, having nothing in common with the melody in style or character. This is one of the great mistakes of the modern schools of music, though we have no doubt that a better taste will prevail when more study is bestowed upon melody as the most important part of musical composition. We cannot too often repeat, that harmony ought always to be considered as subordinate to melody, although we are aware that certain great and peculiar effects may be produced by harmony, independent of melody in the true sense of the latter term; for instance, such effects are heard in certain forms of solemn ecclesiastical harmony that contain hardly a vestige of melody. The effects of mere harmony are often very striking when produced by a certain combination of voices, or of instruments, or of both, and in a building sufficiently spacious and suitably constructed, or even in the open air when heard at a certain distance, and especially if they pass over an expanse of still water. In ancient ecclesiastical music, the length of the sounds and the simplicity of the harmony were well calculated to produce a great effect in large cathedral churches. In such places, rapid changes of sounds, and chromatic harmonies, never produce any thing but confusion; and this ought to be kept in view by the young composer. He must calculate the effect that his music will produce in a cathedral or in a theatre, a concert-room or a private room. No one who has not observed the difference of effect produced by the same music in places of different size and construction, can understand how important it is to attend to all this. But we must not encroach here upon another section of this article.

The study of melody is by far too much neglected. Harmony has generally in these days usurped its place; and we find ten good harmonists according to rule, for one good melodist. The reason is, that a man without real musical genius may become a very good scholastic harmonist, while a great melodist must be a man of great genius. Handel was in his day *one* of the most remarkable musicians for *general* excellence in both melody and harmony; but he was a man of the highest musical genius, and his profound skill in all the harmony of his time could never altogether check the flow from the spring of melody which existed in his mind. In his oratorios and his operas that spring is never failing. It is a pity that Handel's operas are now so little known. They contain much beautiful melody, although that is often disfigured (as in his oratorios) by conventional passages of a formal kind, which must, like all other such passages, become quite antiquated after a short time, having no foundation in any thing but temporary fashion of style.

In the proper order of musical study, melody ought to precede harmony. It is from reversing this order that so many dry unimaginative harmonists have been produced;—men actually rendered incapable of composing good melodies, or of appreciating their beauties when heard. The student ought to have daily before him specimens of the most beautiful and expressive melodies in all styles, and of all nations. It is much to be regretted that there has not been published any judicious and comprehensive collection of such melodies. It would be invaluable to the student. Music.

One of the earliest writers who treated of melody was Salinas, a Spaniard, and blind, but an eminent musician, and professor of music in the university of Salamanca. His work, which is now very rare, was published in Latin in 1577, at Salamanca. The fifth, sixth, and seventh sections of it are devoted to the consideration of the nature of musical, oratorical, and poetical rhythm. There is a great deal of curious and instructive matter in these sections, and he illustrates his text by numerous fragments of melody, some of which are very interesting, being old Moorish, Spanish, or Italian melodies. We have given some of these as curiosities in Plate CCCLXXIII. Salinas says (page 235), "In the three following books (sections) we have to treat of the rhythmical part of music, a part of it not less useful, and even more delightful, than the harmonical part."

Another of the earliest writers on melody was G. B. Doni, the Florentine musical amateur and antiquary. Among his published works (3 vols. folio, 1763) we find many sensible remarks upon melody, and some curious notices of the distinguishing characteristics of national melodies (see, in particular, his *Trattato della Musica Scenica*, vol. ii. of his works). Speaking of the remarkable difference in the pronunciation of Latin by the French, Spaniards, and English, as compared with its pronunciation by the Italians and Greeks, he says, "This difference arises from the diversity of the accents, and the elevations and depressions of sound."..."We may say that common speech is a kind of outlined melody; and the mode of speaking in the recitation of poems, a kind of shaded melody, half finished; while true melody, called by the Greeks ὠδικὸν μέλος, is perfect and finished, and, as it were, completely coloured." (P. 18 of *Trattato*.) With regard to setting of words to music, he says, "One of the most important remarks, and one perhaps not attended to by any person at present, is, that the music should not imitate the words, but the whole sentiment of the poetry; for in this consists true musical expression." He adds, that "Mimics and buffoons adopt the other mode; and, by exaggerated looks, and gestures, and noises, attempt to enforce the words they utter, or to represent the passions they are supposed to feel. (P. 29.) "Melopoeia is the art of composing beautiful melodies, without any reference to counterpoint, which belongs to another part of music." (P. 35.) As to modulation, he says, "The moderns are too scrupulous in wishing to keep always in the same key; a custom perhaps derived from the ecclesiastical chants, but quite unsuitable to varied and scenic melody." (P. 33.) Chapter xvii. of Doni's *Trattato* contains a number of ideas which Reicha has borrowed and developed in his Treatise on Melody. Doni proposes the use of *quinary*, and even *septenary* measures, such as $\frac{5}{2}$, $\frac{5}{4}$, &c., or $\frac{7}{2}$, $\frac{7}{4}$, &c. Reicha has also proposed the adoption of the quinary measure, and gives a specimen of its use in a national dance-tune of the district of Kochersberg, on the Lower Rhine, in the old province of Alsace. Reicha says, from information sent to him, "The manners and customs of the inhabitants of Kochersberg distinguish them completely from the other people of Alsace. Their dances have a particular and remarkable character, and nothing in common with those of their neighbours. The tunes of these dances have a very decided measure of five times. Tradition, in the country, carries back this music to the remotest antiquity."



Music. William Shield, a clever English composer, introduced a movement in this quinary measure into one of his instrumental trios. Two or three other Englishmen, and several Germans, have attempted the same measure; but it has not been generally adopted, though there is no *reason* but *custom* and *habit* why it should be rejected. Doni says (p. 74 of *Trattato*), "If the septenary measure could be conveniently adopted, it would produce a more remarkable effect upon the ear than any other, and it would suit lachrymose and compassionable subjects. But we let this alone, because it will be no small matter if we bring the quinary measure into use."

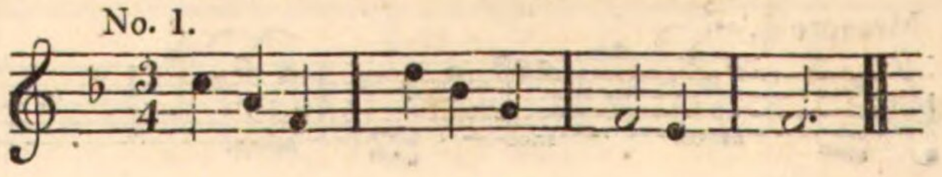
The following passage from Doni relative to national melodies is interesting, as having been written more than two centuries ago: "Although Italian music seems the most excellent and varied of all, still let us remember that *non omnis fert omnia tellus;* but that one nation abounds in one thing, another in another thing, according to the different genius of each. Therefore the judicious composer may draw from French airs (which have great variety and lightness in lively subjects), good passages and spirited and pleasing melodies. From the old Spanish airs he may derive many hints regarding melody and rhythm, for grave and majestic subjects; for example, from the Pavana; and from modern airs, and those borrowed from the Moors, he may also draw beautiful and lively melodies, but more soft and effeminate. Portuguese melodies may afford him very tender and affecting passages; and, for mournful and lugubrious subjects, he may enrich his imagination with Sicilian melodies, although they have little variety; and if he will go farther, he will find in English" (Scottish? Irish? Welsh?) "and German airs something to imitate in certain bold and military conceptions; there being perceptible in these airs, especially the German, a certain manly and military character," &c. (P. 131, *Trattato.*) The Spanish ex-jesuit Eximeno, in his work *Dell' Origine, &c. della Musica*, published in 1774, says, "In Italy national airs are not common, for most of the people have so fine an ear that it is enough for them to hear the opera airs, in order to amuse themselves afterwards by singing them in the streets." However, he adds, "The country people and villagers have their songs and tunes in a simple style, but in good taste. The romanella, which they sing accompanied by the colascione, is full of good taste, and still more so the tamburo of the Trasteverini. The taste for songs reigns chiefly in Venice; and although they are usually composed by professional musicians, the people learn them easily."

In Plate CCCLXXIII. we give the tamburo, No. 1, and a beautiful Venetian air from Eximeno, No. 2. The tunes to the Spanish romances Eximeno thinks "monotonous and tiresome," and believes them to be remnants of Moorish melody, or else ancient sprouts of the Canto Fermo. "The most tasteful popular songs of Spain are the Seguidillas, of which there is an endless variety." (See Plate CCCLXXIII. No. 4.) We have given a few other specimens of curious melody which have not before been published in Britain. Among these are (Plate CCCLXXIV.), No. 15, a German melody of the year 1425; No. 17, Egyptian air, performed "with all their might" by the musicians of Grand Cairo, when the principal inhabitants, headed by all the sheiks of the town, went to meet Bonaparte on his return from the Syrian expedition. It was dictated by the chief of these musicians to one of Napoleon's. The performer accompanied it on the instrument called in Arabic *al œoud.* Hence the English name of *lute*, Spanish *laudo*, Italian *liuto*, French *luth.* No. 18 is a song and chorus of cannibals. This curiosity was written down by a Russian voyager (Councillor Tilesius) in 1804, and published in the Leipsic *Musical Gazette*, No. 17, in 1805. Tilesius passed a night in listening to this music among these savages, in one of the islands of St Christina. He says, "there was something frightful in this melody, which almost drove one to desperation, and seemed to make one hear his own funeral dirge." He mentions, as a curious circumstance, that the voices of these savages passed, by sliding through very small intervals, from the E to the G of this chorus, or the converse. The savages, several hundreds, men and youths, sung it in unisons, or octaves, and danced at the same time. They marked the measure by clapping their hands, and also by beating drums. Tilesius explains the meaning of this chorus. "The warriors have returned from battle. It is night. One of them perceives a distant fire on the enemy's island. He asks, 'Where is the fire?' The chorus answers, 'Upon Tanhuatah Montanioh, among our enemies! they are roasting our dead and the captives!' This renders them frantic; they call for fire immediately, and feel a pleasure in being able to use it in reprisal against the dead, and prisoners taken from the enemy, but not without compassion in thinking of the wives, the children, the relatives, who will weep at that moment. Finally, they reckon the days from the first to the tenth, indicating the time fixed for feasting upon the victims, and for solemnizing the victory." An English writer of the last century, when speaking of Scottish music in one of his essays on various subjects, says, "Who was it that threw out those dreadful wild expressions of distraction and melancholy in *Lady Culross's Dream?* an old composition, now, I am afraid, lost; perhaps because it was almost *too terrible for the ear.* I'll venture to swear that David Rizzio was as innocent as any lamb of all such frantic horrors." The examination of the melodies Nos. 1 to 18 inclusive will suggest matter for reflection. We would point out especially the elegance of No. 2, the expressive character of No. 4, the beauty and absolutely *modern modulations* of No. 14 (of fifteenth century), the curious rhythm and changes of measure in No. 15, the wild and singular cast of the Egyptian air, No. 17, and the hideously lugubrious character of the cannibal chorus, No. 18. Burckhardt, Bowdich, and some others, have published curious specimens of African melodies. We can only refer to these, and to a great variety of national melodies, Russian, Danish, Swedish, Norwegian, Polish, Bohemian, Hungarian, Greek, Spanish, Italian, Sicilian, Welsh, Irish, Scottish, &c. &c. that have appeared from time to time in collections, or detached. Among foreign national airs, we may mention some rescued from obscurity among the mountains of Auvergne. by that admirable English amateur and accomplished composer, the Honourable George Onslow. He has introduced some of these interesting national tunes of Auvergne into his violin quartetts, &c.

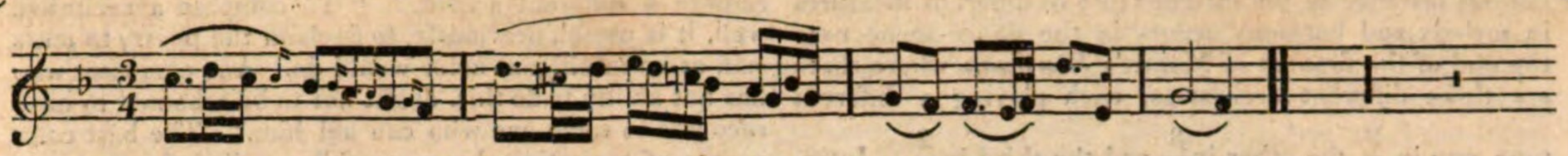
Rhythm and structure of melody.

Reicha, in his *Traité de Melodie*, is the latest writer upon this subject. Several valuable works upon it by Italian and German writers had preceded Reicha's treatise. Among these writers may be mentioned Pisa, Sacchi, Nichellman, Riepel, Koch, &c. A translation of Reicha's Treatise on Melody, with some judicious notes and modifications, would be a useful offering to British students of music. Before we proceed farther, we must advert to what we consider as an error in treatises on melody or harmony. We allude to what are called *passing* notes, or *unreal* notes, and which are said not to form any *real* part of the melody or the harmony. It appears to us very plain that this is a mere fallacy, and that *every sound* that is *actually heard* in a melody or a harmony is just as *real* a sound as any other can be. For example, we take the following melody:

No. 1.

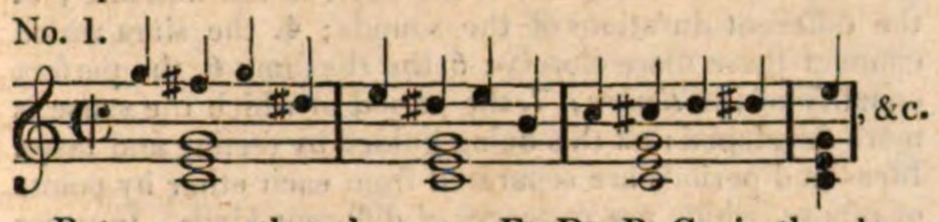


Music. And then this one, No. 2. Music.



We shall be told that this No. 2 is only No. 1 varied, or embellished by notes of grace, *passing* notes, *unreal* notes, that do not belong to the melody. But No. 2 is a melody *per se* as much as No. 1; and supposing No. 1 had never existed, No. 2 would still be a real melody, and all its sounds *real* sounds. It would startle us were a poet to say, "Such and such words in my poem are not to be taken as *real* words, but merely as *passing* shadows of words that do not belong to the language, or melody, or harmony, or meaning of my verses." There can be no doubt that if we pre-establish a certain chord, we may say that any sound that does not form one of the sounds of that chord is not a sound belonging to it. This is easily exemplified.

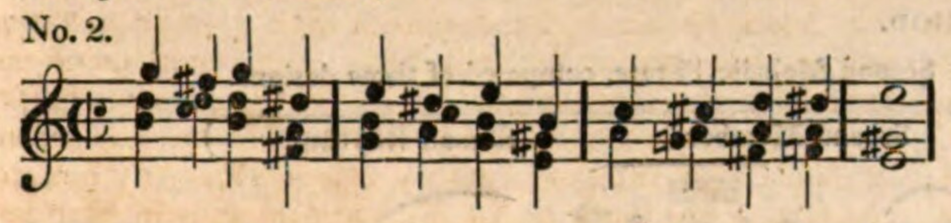
No. 1.



&c.

But suppose that the notes F♯, D♯, B, C♯, in the above passage were to occur as *real* notes in a melody—and might they not do so?—what then becomes of their *unreality?* For instance,

No. 2.

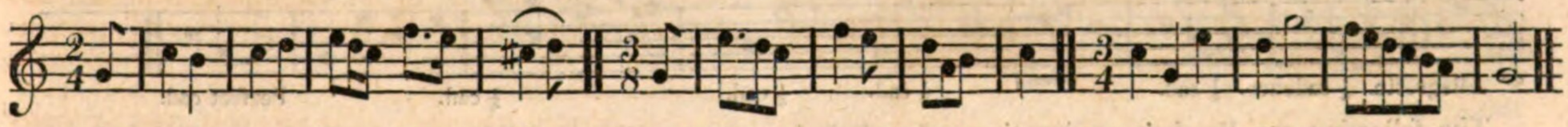


To avoid all uncertainty of *meaning* as to *intonation*, we shall take these passages as if performed on the organ or the piano-forte. All that we could rationally say in such cases would be, that the ear *may* be pleased by the one harmony as well as by the other, according to circumstances; but that the melody in both cases is a *real* melody, and cannot be explained *harmonically* in either case by the *generally received system* of the fundamental bass.

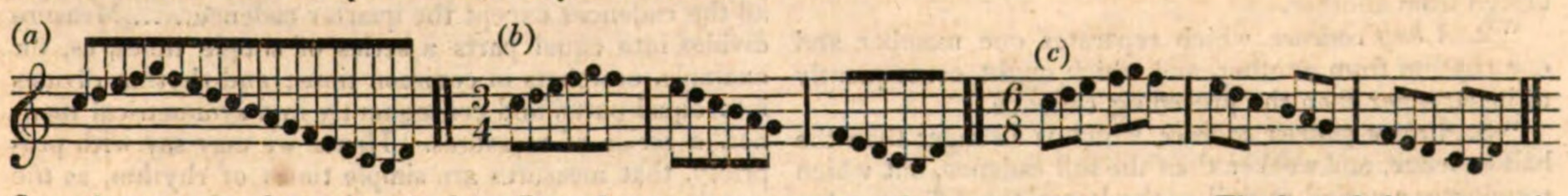
Musical rhythm, in its general sense, applies to the symmetrical arrangement of the sounds of a melody.

Measure is the manner in which these sounds are divided into portions of equal duration, and this division is represented in musical notation by means of bars; the notes, pauses, &c. contained between two bars constituting a measure.

Times, as they are called, are the subdivisions of a measure into its simpler aliquot parts, binary or ternary, or quaternary or senary, &c. It might be better to use the terms *accented* or *unaccented aliquots*, rather than *strong* or *weak times*. But musical nomenclature requires a thorough reformation. It is the perception of a decided rhythm in the sounds of a measure that has given rise to these terms *strong* and *weak times*. Certain modifications of two, or three, or more aliquot parts of a measure, in regard to accentuation, how faint soever this may be, or the regulated succession of sounds of unequal duration, will impress the ear with a particular rhythm, binary or ternary, or quaternary or senary, &c. &c.

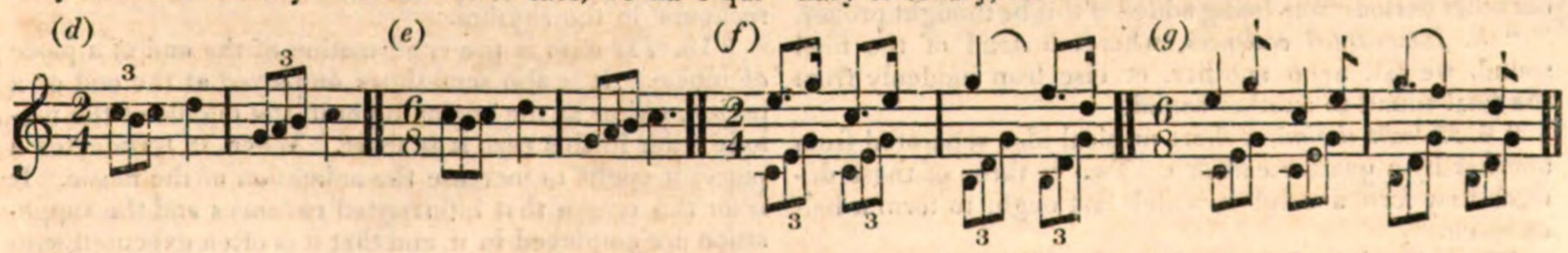


Were all the sounds of the following passage (*a*) performed with perfect equality of intensity and duration, no strong nor weak times would be perceived; and yet it is divisible into exact measures of different kinds, producing different rhythmical effects, as at (*b*), (*c*).



Sometimes, to produce a particular effect, the accent or emphasis is thrown upon the weak times of the measure.

It is plain enough that the simplest elementary forms of musical measure are the binary and the ternary, and that the compound forms arise from a duplication, or quadruplication, &c. of the binary, or a duplication, triplication, &c. of the ternary, or by certain combinations of the binary with the ternary. In the latter case, we have quinary and septenary measures. The last of these is not in use, but the former is occasionally employed. It may be remarked, that although these quinary and septenary measures are generally avoided by composers, yet *periods* of melody containing five or seven *measures* are of frequent occurrence. In binary and quaternary measures we often meet with triplets which really belong to a measure ternary or senary, &c.



Thus (*d*) produces on the ear the same effect as (*e*), and (*f*) the same effect as (*g*); so that there would really be no impropriety in writing (*e*) for (*d*), or (*g*) for (*f*). Haydn's beautiful canzonet, *O Tuneful Voice*, and the larghetto movement of Beethoven's charming *Adelaida*, are examples of the use of compound ternary measures; while the sign C at the clef, and other circumstances of notation, lead one by the eye to infer that the measures are compound binary ones. But the effect upon the ear, from the predominance of continuous triplets in the ac-

Music. companiment, is that of compound ternary measure. A curious instance of the intermixture of different measures in melody and harmony occurs in the dance-scene near the end of the first act of Mozart's *Don Juan*, where there are three different orchestras, each playing a different tune, one in $\frac{3}{4}$, the other in $\frac{3}{8}$, and the third in $\frac{2}{4}$. Intermixtures of different measures were not uncommon in the works of composers of the fifteenth and sixteenth centuries, but generally produced nothing better than confusion.

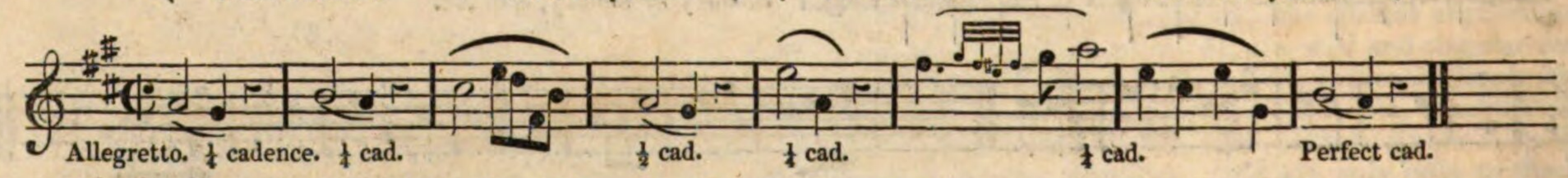
The only modern music that is not divided into measures is simple recitative. It has often been desired by composers of music, that the inflexions, the varying sounds of declaimed language, could be reduced to a musical notation more delicate and accurate than the one in common use. To enable us to express such inflexions, a notation for *very minute* intervals, as well as for peculiar accents, would need to be contrived. The attempts to express such declamation are represented by recitatives and *arie parlanti*. Some of these are remarkably expressive, from their near imitation of the inflexions of the voice in declamatory and impassioned language; among others, those of Gluck and Piccini. Beethoven, among the very few remarks that he has left to us upon recitative, says, "Recitative ought to be declaimed as if it were spoken. It is a discourse sometimes accelerated, sometimes retarded, according to what is required by the impassioned expression of the words. The comma, the semicolon, the colon, the period, the sign of interrogation, and of exclamation, each require a different accent." "To compose a recitative well, it is useful, previously, to declaim the poetry to one's self, as an intelligent actor would do. Any composer who has not ability to do this, ought not to be ashamed to have recourse to some one who can aid him." The best composers of recitatives have carefully studied the declamation of the great actors of their day. The danger lies in imitating false inflexions of the voice, intended to express natural feelings or passions. Music.

We shall now give a brief statement of some of the chief points in Reicha's Treatise on Melody, referring the reader to that work for all developments and minutiæ. The treatise consists of a hundred and twenty-three quarto pages of letter-press, and seventy-five plates. "Melody is nothing but a succession of sounds; but if these sounds were placed at random, they would form no sense, that is to say, no melody. It is the same as in regard to words not connected by syntax, nor directed by the understanding. The circumstances that connect sounds together so far as to form a musical sense, are, 1. the key; 2. the measure; 3. the different durations of the sounds; 4. the slurs which connect these more closely; 5. the rhythm; 6. the perfect equality of the *timbre;* 7. the period in which the sense is more developed; all this being guided by feeling and taste. Ideas and periods are separated from each other by points of repose, which are cadences of different kinds. In order to see how all these objects form melodic ideas, and contribute to connect them together, it will not be superfluous to analyze here the following period:

PERIOD.

First Melodic Phrase, composed of three designs. Second Melodic Phrase, composed of three designs.

(First Member. First Rhythm.) (Second Member. Second Rhythm.)



The following are Reicha's explanations of technical terms, which he uses in his treatise on melody.

"1. *A quarter cadence*, or a point of repose weaker than a half cadence, and which serves to separate one melodic design from another.

"2. *A half cadence*, which separates one member and one rhythm from another, and which ought consequently to be stronger than the preceding cadence.

"3. *A three-quarter cadence*, which is stronger than the half cadence, and weaker than the full cadence, but which terminates a period as well as the latter, the difference between them existing only in the key in which we end. Thus, the first period of an air of two strains which ends on the dominant, would be only a three-quarter cadence, because another period is required in order to return to the tonic.

"4. *Perfect cadence*, which terminates the period in a positive and indubitable manner; but which does not hinder other periods from being added, if this be thought proper.

"5. *Interrupted cadences*, where, instead of the final sound, we fall upon another, or else leap suddenly from the final sound to another sound.

"6. *Melodic design*, a short musical idea separated from another by a quarter cadence. Two or three of these designs may form a member, which last ought to form a half cadence.

"7. A member of a period is composed of one or of several designs, and ought to make up a rhythm, and form a half cadence.

"8. *A period* may be composed of different designs and of different members. Its cadence is final, or else a three-quarter cadence, which may be called a perfect cadence relative to the key.

"9. *Rhythm* is the extent or the symmetrical and comparative number of the melodic members. It may have all the cadences except the quarter cadence.....Measure divides into equal parts a series of simple times, as, for example, crotchets in common time; and rhythm divides into equal parts, and consequently in a symmetrical manner, a series of measures. Hence we may say with propriety, that measures are simple times of rhythm, as the crotchets and rests are the simple times of a measure.

"10. *The complement* is a little melodic design that fills up the pauses which occur between the members.

"11. *The supposition* is a measure which, in the theory of rhythm, counts as two; 1. as final measure of the first rhythm; and, 2. as initial measure of the following rhythm.

"12. *The echo* is the repetition of a part of a melodic design, executed by other instruments, and which is not reckoned in the rhythm.

"13. *The coda* is the confirmation of the end of a piece of music. It is also sometimes employed at the end of a period, either at the beginning or in the middle of the melody; but in this case it is short. When it terminates a piece, it ought to increase the animation of the music. It is for this reason that interrupted cadences and the supposition are employed in it, and that it is often executed with an accelerated movement. As to the length of the coda, it depends upon the duration of the piece. When the coda finishes a grand piece, it may be compared to the peroration of an oratorical discourse."

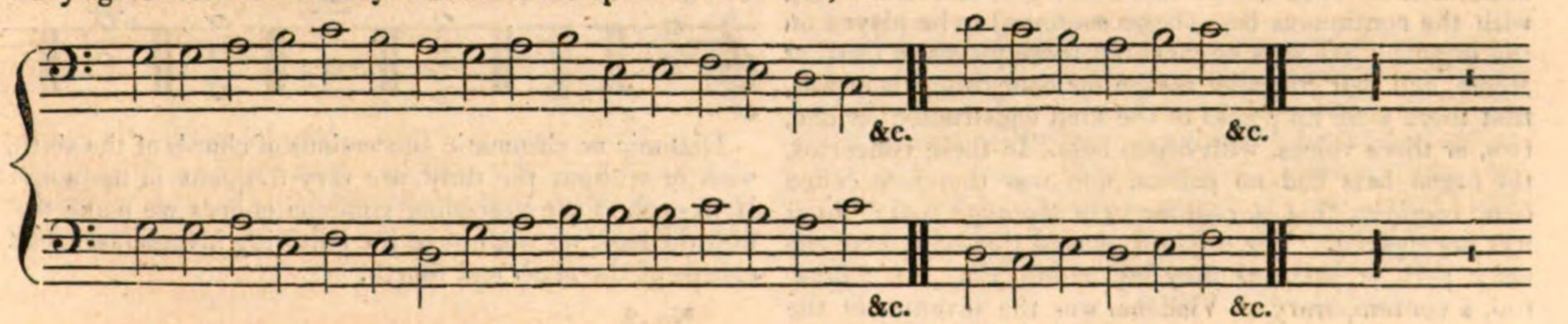
We pass over Reicha's explanations of "Le Retard de

Music. la Cadence," and of "Le Conduit," as these relate merely to arbitrary embellishments introduced just before a final cadence, or between one period and another.

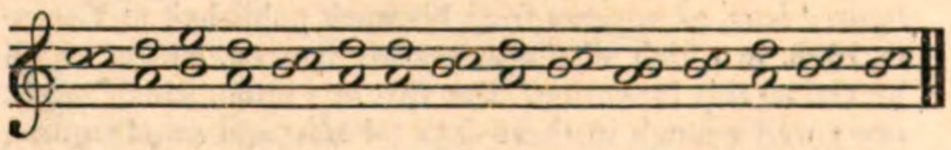
To please a vitiated public taste, most modern performers make an overwhelming use of such *embellishments*, as they are called. Among singers, for instance, none would be listened to who did not prepare to conclude every melody, no matter how simple and unsuited to such trappings, with a flourishing cadenza and a long *shake*. Pietro Verri very properly abominates all such formal shakes and cadences, and desires all rational melodies to be finished off by a simple appoggiatura. G. M. Raymond, writing in 1811 of singers of that time, says: "L'un chante avec les épaules, les bras, les coudes, le corps tout entier; l'autre pousse des cris et pratique des élans qui prouvent suffisamment ses bonnes intentions; celui-ci se livre à des mouvemens convulsifs qui peignent l'excès du sentiment; celui-là à des efforts semblables à ceux qui accompagnent les nausées, et qui ne remplacent pas mal les mouvemens de l'âme et les accens du cœur," &c. All this applies too nearly to many of the singers of 1837.

Among most writers upon music, we find great confusion regarding *feet*, *cæsures*, *phrases*, *clauses*, *sections*, *times*, *rhythms*. We think that, in general, Reicha has been more successful in clearing up and simplifying these matters. His $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ cadences come in place of the confusion of cæsures, phrases, clauses, &c. He shows, by numerous examples, the nature of these melodic cadences, and of the final cadence or period; and also of melodic designs, members of periods, periods, rhythms, &c. A discrepancy occurs in what he says (above cited) regarding $\frac{1}{4}$ and $\frac{1}{2}$ cadences in melodic *designs* and *members;* and we have to object to what he says about *the supposition* (article 11, *supra*), as being a measure that counts as two in the theory of rhythm. In a matter of this kind there are really no *suppositions* made by the ear. It hears neither more nor less than what it hears. As to the echo (article 12) "not being reckoned in the rhythm," we conceive that it ought to be just as much so as any other passage in the melody. Reicha refers to Haydn and Mozart as models of skill in the development of a melodic subject, and we cordially agree with him. He says that a treatise upon melodic modulation is wanted; also one upon the accompaniment of melody. We refer to Plate CCCLXXV. No. 19, for an example of the mixture of different rhythms in a melody of Paésiello. There is an almost inexhaustible store of melodies, in all their forms, in the works of ancient and modern composers. The student who examines these works will find, that the modern melodists have, in general, little to boast of in originality. To give an instance, one of the most popular vocal compositions in England, *Oh, Happy Fair*, is framed in its commencement, in melody and harmony, upon a church chant of C. P. E. Bach. Music.

Harmony has been defined by an eminent French philosopher of our day, "a succession of chords, subjected to certain laws, according to which several different melodies, governed by a common rhythm, and heard together, produce an agreeable effect to the ear." This definition is, like many other technical ones, unintelligible to every person who has not studied harmony. But we shall make only one objection to it, which is, that very frequently harmony contains little or no melody, properly so called. It must be kept in view that harmony has its own peculiar means of producing effects, independent of melody, or, at least, of any prominent melody. It is more vague in its effects than melody; and, being more complicated, is less generally relished and understood than the latter. A chorus of Handel, or a symphony of Beethoven, requires a trained ear to relish and understand it fully. The progress of both melody and harmony was slow in improvement, as the history of music shows. As the materials of each were increased, like the enrichment of a language, melody and harmony assumed new forms, and became more copious and expressive. To assign limits to what may be called *improvements* in melody or harmony is impossible, since the plastic nature of the human ear is such as to be capable of being trained to relish almost any peculiarities in music, as in the sounds and inflexions of language. When we find that, in ancient times, a rude, unmelodious, ecclesiastical chant, and its accompaniment by another voice in consecutive octaves, fifths, and fourths, were considered as the perfection of melody and harmony, it is hard to say what the human ear may or may not be trained to relish. Gerbert, in his work *De Cantu et Musica Sacra*, gives several specimens of this strange harmony of the fourteenth century. See vol. i. pp. 376, 392, 435, 6, 7, 8, and 456, 7. Harmony.



But something still more curious than this is given by Franchino Gafforio in the fourteenth chapter of the third book of his work *Practica Musica*, published at Milan in 1496. Under the head "De Contrapuncto Falso," he says that it was anciently the custom to sing a counterpoint composed of dissonances; that is to say, of second major and minor, perfect and major fourth, seventh, and ninth; and that such counterpoint was used in the fourth century in solemn vigils, and in certain masses for the dead. He gives the following example of this horrible counterpoint, as having been sung in the cathedral of Milan, from an ancient mass for the dead. He confesses it to be hideously bad. We avoid the alto clef, for the reader's sake; so the example should be performed an octave lower than it is here written.



Doubtless the human ear was *then* not a different organ from what it is *now*, and yet we should consider such harmony as intolerable. But to many persons the noisy confusion of certain modern compositions for orchestras *and* voices is delightful; voices yelling and growling, and, in the orchestra, all sorts of heterogeneous instruments mingled together to make a chaos of deafening noises. When we find, in a celebrated German orchestra, musical effects attempted to be produced by cracking of whips, firing of pistols, jingling of post-horse bells, ringing of bells of all sorts and sizes, thrumming on the Russian balalaika, beat-

Music. ing of drums, and so on, and all this received with rapture by a civilized European audience, we may well be justified in saying that it is hard to tell *what* the human ear may or may not be trained to relish in music, or rather in noise. Such music reminds us of the pewter dish, the tongs, the bellows, and the salt-box, used as solo or concerto instruments, according to No. 90 of the Babbler; or of the hog-concert, produced by order of Louis XI. Bayle gives the passage on this subject from Bouchet, *Annales d'Aquitaine.* A great number of hogs of different ages were confined in a tent covered with velvet. In front of the tent there was an apparatus with keys like an organ. These keys communicated with the hogs in the tent, and were armed with needles, so that when the performer touched the keys, the hogs were pricked by the needles, which "les faisoit crier en tel ordre et consonance, que le Roy, et ceulx qui estoient avec luy, y prindrent plaisir."

The opinions of theorists on the subject of chords alone, without reference to their successions and modulations, are very much at variance. Some reckon only one single fundamental chord, formed from the first harmonics of a vibrating string, and which chord, they say, contains all the other chords. Other theorists assume two fundamental chords, others seven, others twelve, others thirteen, others seventy, and so on. Another theorist reckons so many as 3600, and among these, 700 dissonant fundamental chords. Besides all this perplexity and contradiction, these theorists give no satisfactory explanation of a multitude of phenomena belonging to modulation and harmonic combination. We would advise the student to pay very little attention to theories, but a great deal to the works of the best composers. Our space permits us to make only a few occasional remarks upon some received opinions regarding harmony, which seem to us to be erroneous.

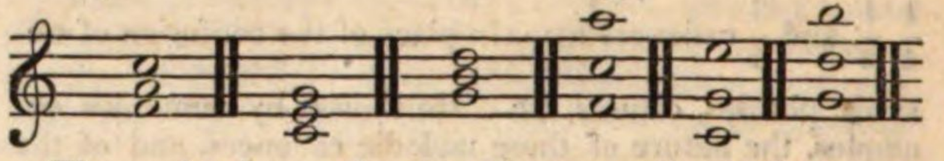
Hitherto, what is called thorough bass has been confounded with figured bass; and both, as if one and the same thing, have been ascribed to L. Viadana as their inventor, in the beginning of the seventeenth century. But it appears that Viadana was not the inventor of figured bass, and that his thorough bass (*basso continuo*) has nothing whatever to do with figured bass, or with the doctrine of the progressions of chords. This appears clearly from his Italian work published at Venice in 1603, in five volumes 4to. It contained what he called "a hundred ecclesiastical concertos for one, two, three, and four voices, with the continuous bass (*basso continuo*) to be played on the organ." He says he invented these pieces in 1597, at Rome, and that his chief reason for composing them was, that there were no pieces of the kind constructed for one, two, or three voices, with organ bass. In these concertos, the organ bass had no pauses, and was therefore called *basso continuo*, that is, *continuous* or *thorough bass;* but it was not figured. The organist played this bass, *and* the voice part, or parts, as they lay before him. G. Sabbatini, a contemporary of Viadana, was the inventor of the *figured bass*, as appears from his work published at Venice in 1628, in which all the basses are figured, and in which he claims this invention. But this invention, which might serve well enough in these days for *slow* and *simple* music, accompanied on the organ according to *certain fixed rules*, has been, unfortunately, brought down to our day, when it is worse than useless, although the teaching and practice of it are still persevered in, to the great disadvantage and perplexity of musical students. Besides, different composers and different nations have different ways of figuring their basses, which adds to the confusion and difficulty. This clumsy contrivance should be entirely abandoned by all modern composers, who ought to write down in the common notation, fully and exactly, the accompaniment as they wish it to be performed.

A chord, as it is called, consists of two, or three, or four, or more sounds, heard at the same time. A primary *consonant* chord consists of intervals such as those given in the following examples, No. 1, A, B, and No. 8, *a*, *b*. Examples of primary *dissonant* chords are given at No. 4, *a*, *c*. Other dissonant chords will be afterwards noticed. The tonic or key-note of every scale may be considered as the central point to which, in the course of a melody, or a harmony, the other sounds of the scale converge, or from which they diverge; in the former case producing tonic cadences or reposes, and in the latter, imperfect cadences and inconclusive passages. We have already seen that the sounds of a scale, whether major or minor, may be derived from the harmonic products of three sonorous bodies, representing the tonic, the dominant, and the subdominant. In the scale of C major, for example, the simplest harmony belonging to the tonic, the dominant, and the subdominant, considered as bass sounds, will appear in the three following chords, either as they stand at A, or with a changed position, or inversion, of the two upper sounds in each, as at B.

No. 1.

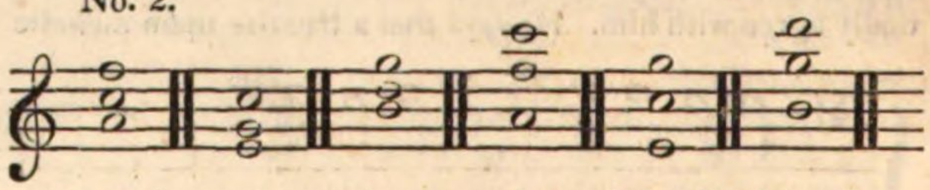
Subdominant Common Chord. Tonic Ditto. Dominant Ditto. Changed Position.

A. B.



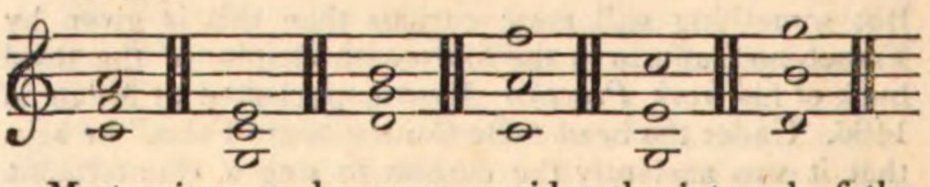
These chords, as they stand, cannot form a harmonic succession, on account of the consecutive fifths between them. In harmony, as in melody, the intervals are reckoned from the lower sound upwards. Each of these chords is called a major common chord, and consists of lowest or fundamental sound with its major third and perfect fifth. The change of position at B makes no difference in the name of the chord, but only in its effect. The closest possible position of the intervals, as at A, is called *close harmony.* Their altered position at B is called *extended* or *dispersed harmony.* By making the thirds of these chords the bass sounds, we obtain the following inversions, called chords of the sixth. The lowest sound of a chord is the bass for the time being.

No. 2.



Diatonic or chromatic successions of chords of the sixth, with or without the third, are very frequent in harmony. If in each of the preceding common chords we make the fifth the bass, we shall have the following inversions, called chords of the sixth and fourth.

No. 3.



Most writers on harmony consider the interval of the fourth as a dissonance, while in truth it is a consonance, as is clearly shown by its forming one of the intervals in the perfect common chord, which contains no dissonance of any kind. Besides these three principal chords of the major scale, with their inversions, and which are all *consonant*, there is an important *dissonant* chord formed by adding the minor seventh to the fifth and third of the dominant. This is named the *dominant* seventh. We subjoin it (*a*), and its three inversions (*b*).

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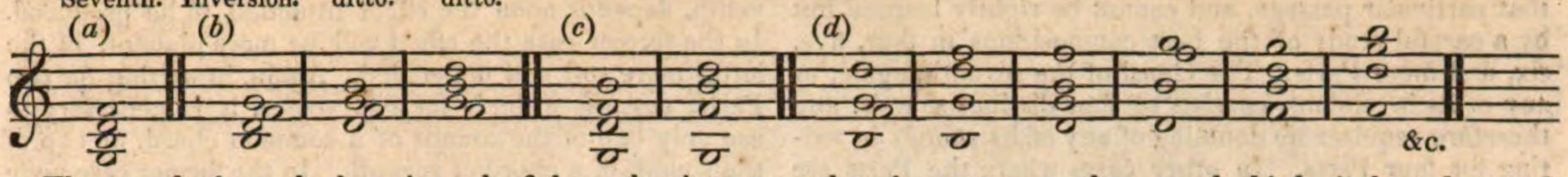
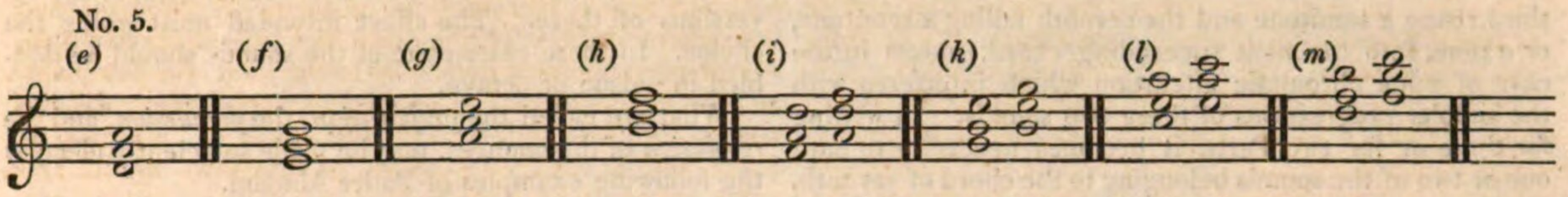
No. 4.



The sounds above the bass, in each of these chords, may be placed in various positions, some of which are shown at (*c*) and (*d*). The first inversion of the chord of the dominant seventh is called the chord of the sixth, fifth, and third; the second inversion, sixth, fourth, and third; and the third inversion, sixth, fourth, and second. In particular circumstances, the second, third, sixth, and seventh sounds of the major scale may each, as a bass, bear a common chord with a minor third. See No. 5 (*e*), (*f*), (*g*), (*h*), and the inversions *i*, *k*, *l*, *m*. But harmony of this kind is generally confined to ancient music, or imitations of the ancient style.

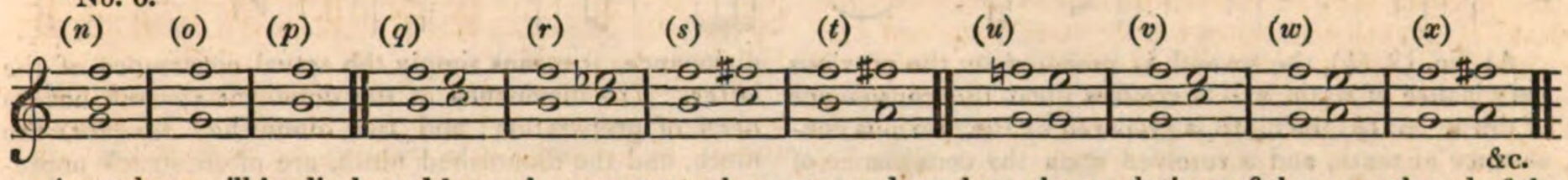
No. 5.



The chord at *h*, with imperfect fifth, is rarely used in what are called *fundamental progressions*.

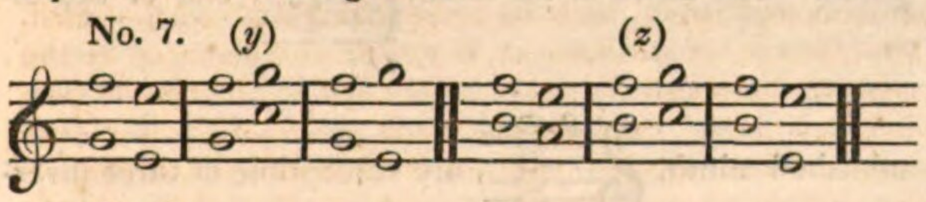
The chord of the dominant seventh contains two primary dissonances which are the least harsh of any in use, and are therefore the most frequently employed; the interval between the bass sound and its seventh, and the interval between the third of the chord and the seventh; see *n*, *o*, *p*. This last is an imperfect fifth, and requires a particular *resolution* (as it is called) in the next succeeding chord, unless some chromatic alteration intervene to change the simple progression; see *q*, *r*, *s*, *t*. For the most common resolutions of the seventh, see *u*, *v*, *w*.

No. 6.



A good ear will be displeased by such passages as those at *y* and *z*, where the resolutions of the seventh and of the imperfect fifth are neglected.

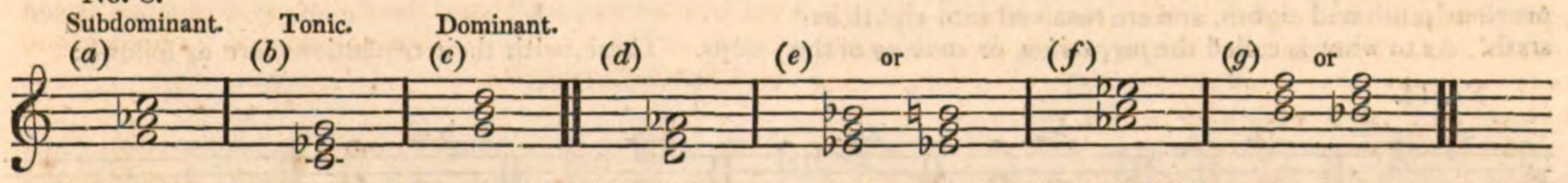
No. 7.



Such passages are bad, whatever number of Parts there may be besides to fill up the harmony; but they are intolerable when there are only two Parts.

The three principal common chords of the minor scale are the following, at *a*, *b*, and *c*.

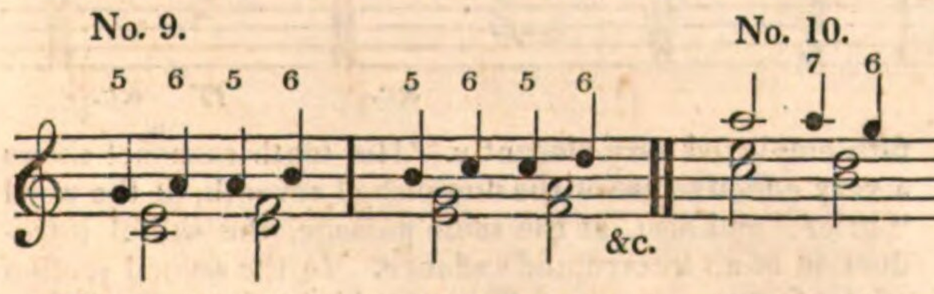
No. 8.



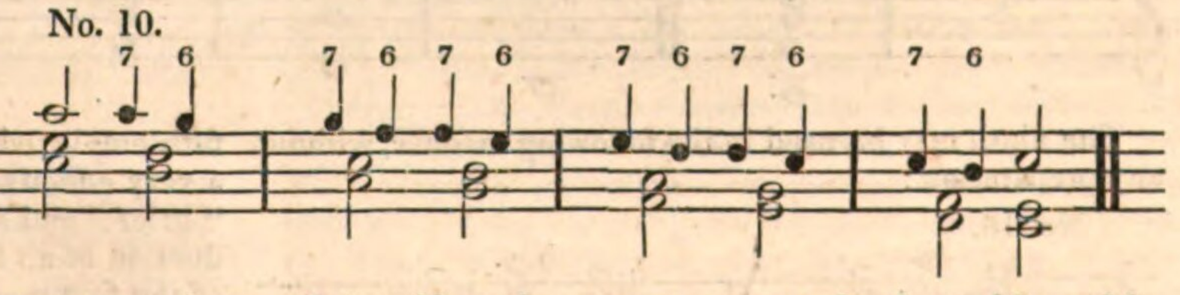
Those subordinate ones at *d*, *e*, *f*, and *g*, may be occasionally used. The same remark applies to them as to the common chords on the second, third, sixth, and seventh sounds of the major scale. Of course, all the common chords in the minor scale may be inverted in the same manner as those in the major scale, thereby producing so many chords of sixth and third, and of sixth and fourth. The positions of their intervals above the bass may also be varied in the same manner as formerly shown.

Sometimes, and especially in ancient harmony, we find a chord of the seventh occurring on every sound of the scale, in what are called *sequences* or *chains* of sevenths, in which the progressions of the bass sounds are by ascending fourths or descending fifths. These dry and formal passages, and their inversions, are now rare. There are some other kinds of sequences still in use; such as the fifth and sixth on each bass sound of a diatonic ascending series, or the seventh and sixth on each bass sound of a descending diatonic series.

No. 9.

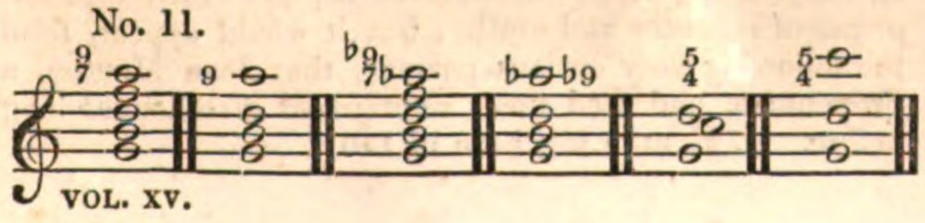


No. 10.



Besides these dissonant chords, there are many other dissonant ones, such as the chord of ninth and seventh, or ninth only; the chord of fourth and fifth; and so on.

No. 11.



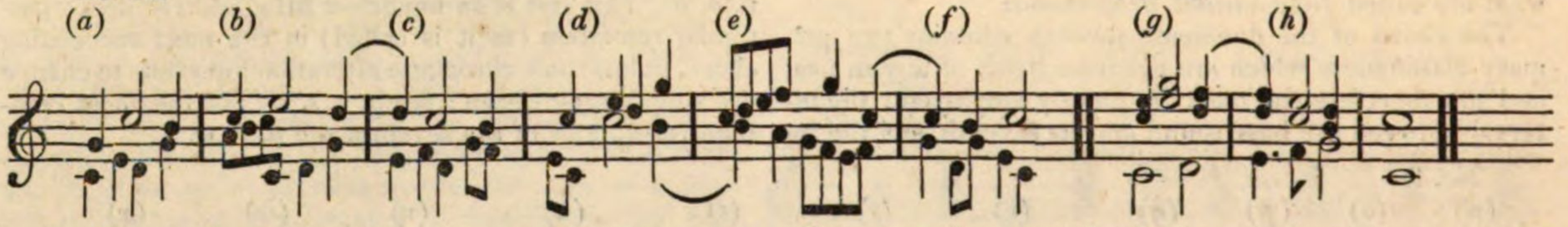
It is evident that every common chord, or either of its inversions, consists of three distinct sounds only; so that in composing for four voices, for example, a gap would occur in the harmony whenever a common chord, or one of its inversions, had to be employed, unless one of these three sounds should be doubled in the unison or octave. This doubling accordingly takes place when there are more than three Parts in the harmony. Which of these sounds

Music. it is best to double, depends entirely upon the nature of the melodic and harmonic succession of sounds in this or that particular passage, and cannot be rightly learned but by a careful study of the best compositions in four, five, six, and more Parts. The chord of the seventh, again, or any of its inversions, consists of four distinct sounds, and therefore requires no doubling of any of its sounds in writing for four Parts. In other cases where the Parts are more than four, the doubling of any of the sounds (except the third, or the seventh of the primary chord) must be regulated by the circumstances of the case. The third and the seventh of the dominant chord of seventh do not bear to be doubled, because the progression of each of these sounds follows a certain course in *resolution* by the third rising a semitone and the seventh falling a semitone, or a tone, into the next succeeding chord, unless in the case of some chromatic alteration which interferes with the simpler progressions of these two sounds. In writing for three or for two Parts, it becomes necessary to omit one or two of the sounds belonging to the chord of seventh, or any of its inversions. Whether the third or the fifth of the primary chord should be retained along with the seventh, depends upon the effect intended to be produced. In the former case the effect will be more piquant, in the latter more soft and undecided. Again, in writing for two Parts, suppose a duett for two voices, it is necessary to use only two of the sounds of a common chord, or two of the sounds of a chord of seventh. In the former case none of the sounds ought to be doubled, except at the beginning, or at a close, or in preparing a cadence, when the unison or octave of the lowest sound of the primary chord, or of its fifth, may be used. In the other case (chord of seventh) there is a choice among the intervals of primary sound and seventh, third and seventh, or fifth and seventh, or the inversions of these. The effect intended must guide the choice. In these cases none of the sounds should be doubled in unison or octave. Music.

What are called the *preparation*, the *percussion*, and the *resolution* of dissonances, may be made sufficiently clear by the following examples of Padre Martini.

No. 12.

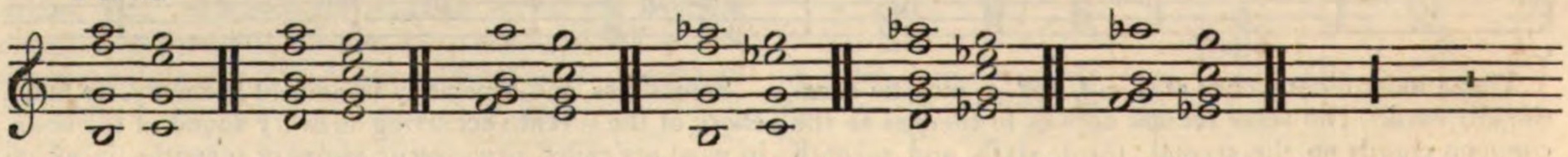
No. 13.



At No. 12, (*a*), the seventh is *prepared* by the previous consonance of sixth, and is *resolved* upon the consonance of third. At (*b*) the ninth is prepared by the previous consonance of tenth, and is resolved upon the consonance of fifth. At (*c*) the sevenths are both prepared by previous fifths, and resolved by the consonances of fifth in the first case, and third in the second case. At (*d*) the second is prepared by third, and at (*e*) by sixth, in the preceding chord.

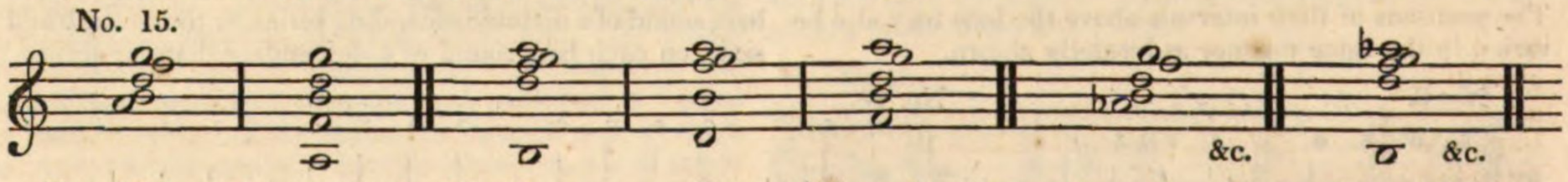
At No. 13, (*g*), the ninth and eleventh are *prepared* by previous tenth and twelfth, and are *resolved* into eighth and tenth. At (*h*) the ninth and seventh are prepared by previous tenth and eighth, and are resolved into eighth and sixth. As to what is called the *percussion*, or *striking* of the dissonance, it means simply the actual occurrence of the latter. The dissonance of the dominant seventh has no need of preparation; and the diminished seventh, the ninth, and the diminished ninth, are often struck unprepared. The chord of the ninth, , and of the diminished ninth, , are susceptible of three inversions. These, with their resolutions, are as follows:

No. 14.



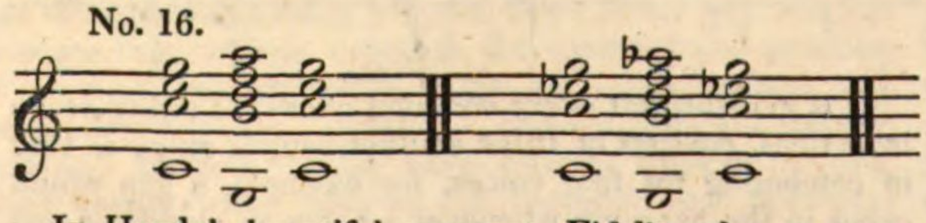
In the chord of the ninth, and in its inversions, the sound forming the fifth in the direct chord is generally omitted. The ninth itself is not inverted, and care must be taken to keep the ninth in its proper interval above the lowest sound of the direct chord, so as to form a ninth or higher octave of ninth above that sound. The following infractions of this rule produce in general a bad effect, especially when prolonged.

No. 15.



The ninth may be used in the following manner, without any preparation:

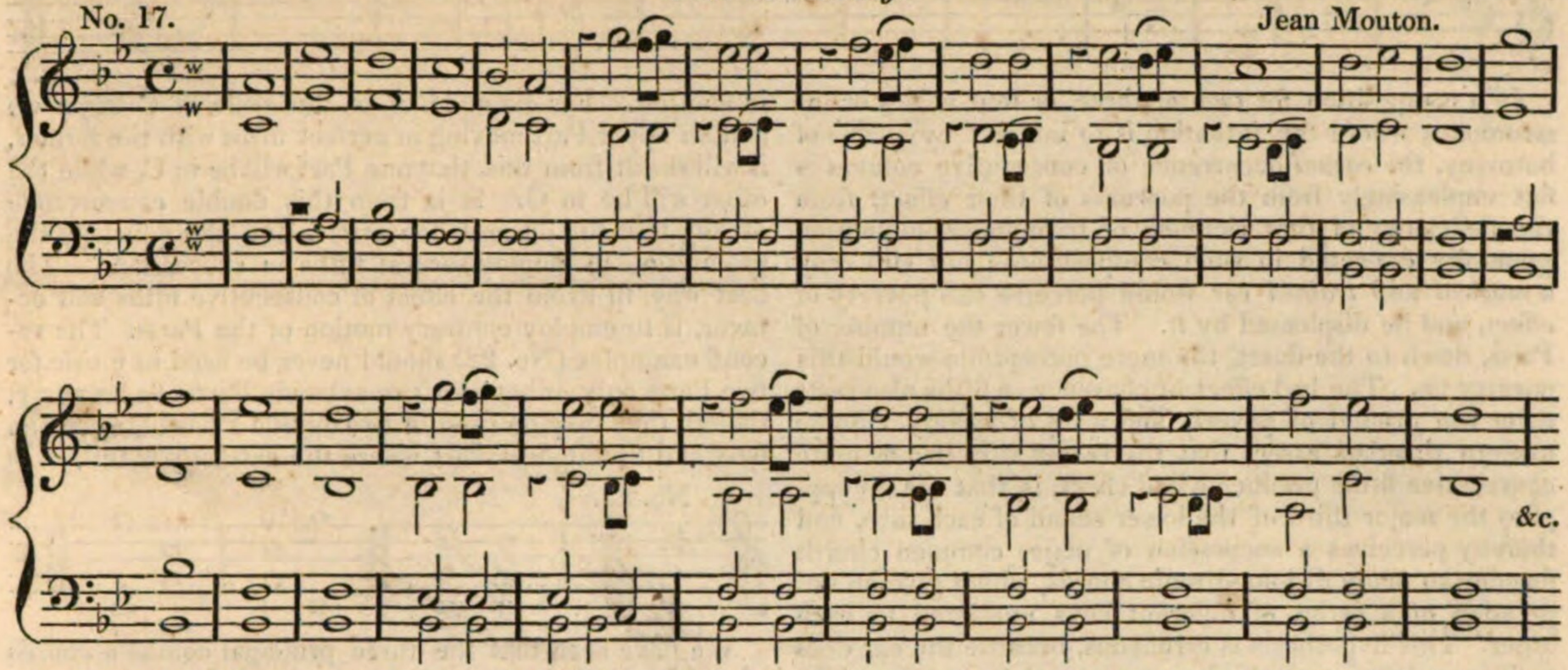
No. 16.



In Haydn's beautiful canzonet, *Fidelity*, there are examples of the use of the major seventh, the ninth, and the diminished ninth, all without preparation. In the same canzonet we find the augmented octave and augmented fifth employed very elegantly. His tenth canzonet shows a very effective use of the diminished seventh, at the word "grief;" and also, at the same passage, the skilful introduction of an interrupted cadence. In the second section of the first movement of Mozart's third quintett in G minor there are many diminished ninths, and ninths and sevenths, introduced very boldly without any preparation. In Italy, about 1580, Monteverde began to introduce *unprepared* sevenths and ninths; but it would appear, from the following very curious passage, that Jean Mouton, a Frenchman, had used these *unprepared* dissonances long before. J. Mouton was born in 1461.

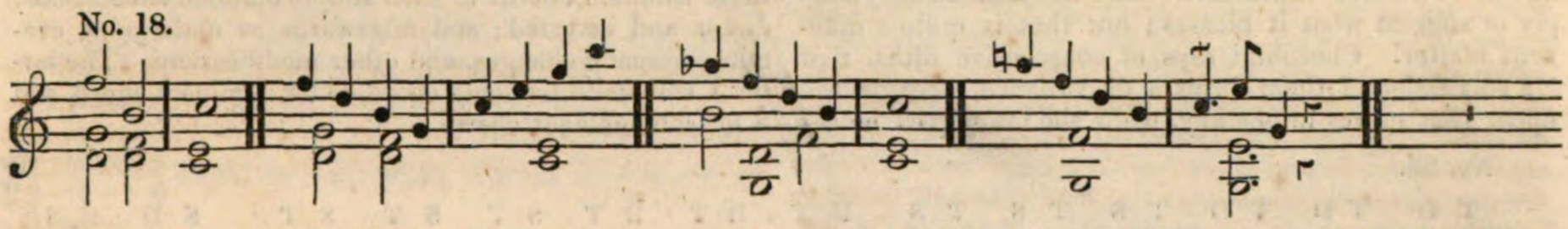
Music. *Examples of Unprepared Sevenths and Ninths, and of both combined, about the end of the Fifteenth or beginning of the Sixteenth Century.* Music.

No. 17. Jean Mouton.



It is worth while to remark, that, in dissonant chords, the dissonance often leaves its place and passes to some other sound of the chord, without being resolved in the way it would have been had it continued to keep its place. For example:

No. 18.



Passages of this kind often puzzle the student, as seeming to contradict the rules given for the resolution of dissonances.

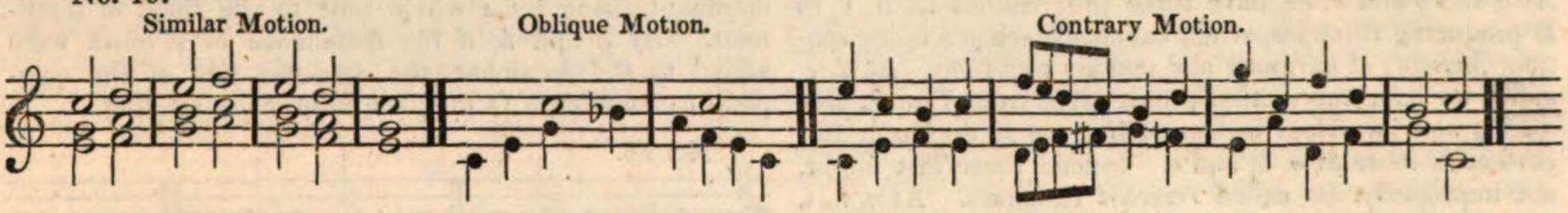
In a series of chords, the progression from one to another may take place by similar motion, oblique motion, or contrary motion. The latter is the most frequent and the most useful, as it gives greater variety to the harmony, and enables us to avoid displeasing consecutions of octaves and fifths.

In similar motion, the Parts move together by conjunct or disjunct degrees, ascending or descending.

In oblique motion, one of the Parts remains on the same degree, while the other moves upwards or downwards.

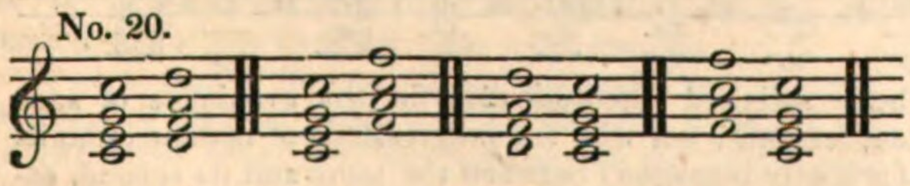
In contrary motion, the Parts move in opposite directions; the one ascending, the other descending.

No. 19.



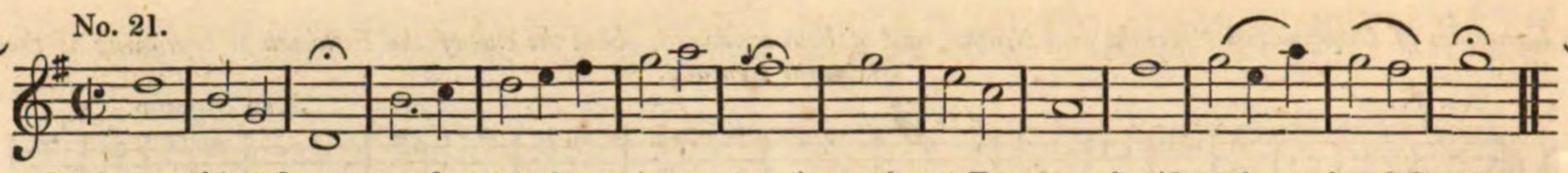
Chords in succession. An examination of all the possible successions of chords, consonant and dissonant, direct or inverted, diatonic or chromatic, is beyond our limits and our purpose. These successions must be learned from an extensive perusal of the best compositions. We must confine ourselves to a few examples and a few general remarks. First, with regard to common chords in succession, two or more of them are not allowed to succeed each other diatonically, or by leaps in similar progression, or what is called similar *motion* ascending or descending.

No. 20.



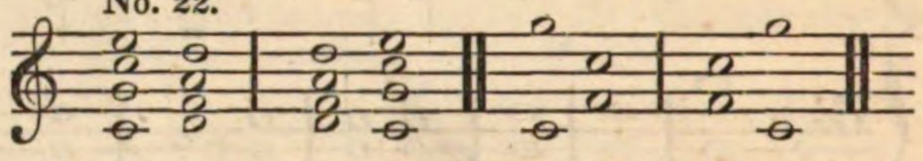
The bad effect of such progressions is much more striking in compositions for voices, or for different instruments, than it is upon such an instrument as the piano-forte, on which the progressions of the different parts are not so distinctly perceived by the ear, owing to the quality of tone or *timbre* of each sound being of the same kind. It ought to be remarked, that this last circumstance is too much neglected in writing for the organ or the piano-forte, and that in consequence many particular passages of harmony written for one of these instruments produce little or no effect, or even a bad effect, while the same passages, if performed by different voices or different instruments, would be good and effective. In the above successions of common chords (No. 20) there are consecutive fifths and octaves, both of which, and especially the former, are prohibited in all cases where *the ear perceives them* and is displeased by them. There is no other rational rule against their use. With regard to consecutive unisons or octaves, daily experience proves that they are not in themselves displeasing when they are employed in the reinforcing of some particular melody or passage of melody. Were this not so, there would be no such thing in choruses or in orchestras as ten, or twenty, or more voices or instruments, performing the same melody in unison or in octaves. Haydn said that one of the most overpowering effects he ever experienced from music, was when he heard the singing of the subjoined melody in unison by a vast number of trained children in St Paul's Cathedral at London.

Music. No. 21. Music.



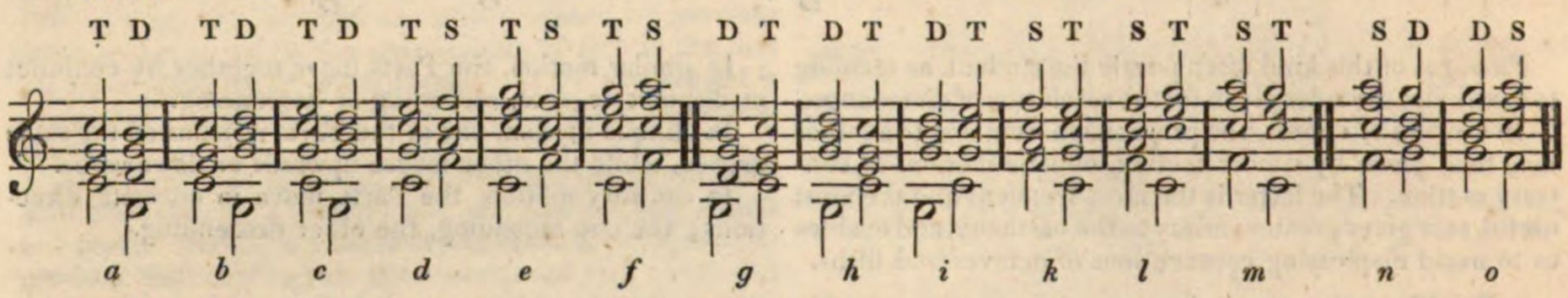
In a composition for two, or three, or four voices or instruments, where the intention is to interest by means of harmony, the *casual* occurrence of consecutive octaves is felt unpleasingly from the poorness of their effect, from the deficiency of that richness of harmonic combination generally expected in such compositions; but still only a *musical* and *trained* ear would perceive this poverty of effect, and be displeased by it. The fewer the number of Parts, down to the duett, the more perceptible would this poverty be. The bad effect of consecutive fifths also rests upon the ground of poverty and want of variety. Some modern theorists assert that the *reason* why two or more consecutive fifths produce a bad effect, is, that the ear supplies the major third of the lower sound of each fifth, and thereby perceives a succession of major common chords forming so many disjoined tonic chords, which give an impression of a series of different keys unrelated to each other. This hypothesis is erroneous, because the ear does really supply no such thirds, nor any other sounds. The ear, in harmony as well as in melody, supplies nothing beyond what it actually hears. It has to do with nothing but its own actual sensations. The *imagination* may supply or suggest what it pleases; but that is quite a different matter. Cherubini says of consecutive fifths, that "a succession of them forms a discordance, because the upper part moves in one key, while the lower part moves in another. For example, if to the scale of C major we add an upper Part moving in perfect fifths with the former, it will result from this, that one Part will be in C, while the other will be in G. It is from this double concurrence of key that the discordance arises, and consequently the prohibition to employ several fifths in succession." The best way to avoid the effect of consecutive fifths and octaves, is to employ contrary motion of the Parts. The second examples (No. 22) should never be used in music for two Parts only, or between two extreme Parts of a harmony, though they may be used in two middle Parts between the bass and the highest Part where the harmony is full.

No. 22.



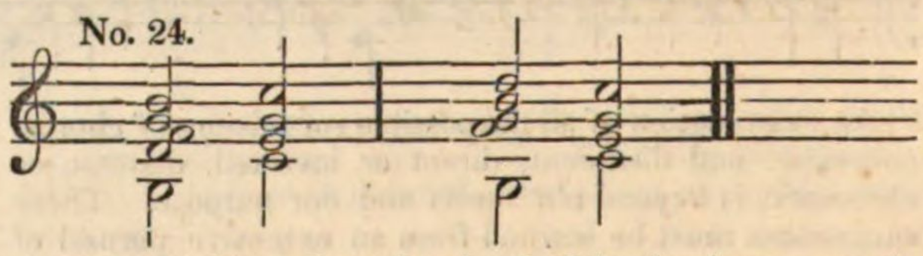
We have seen that the three principal common chords of a scale are those of the tonic, the dominant, and the subdominant; and that the principal dissonant chord is the chord of the dominant seventh. We shall first examine these common chords in their simple diatonic successions, direct and inverted; and afterwards as undergoing certain chromatic changes, and other modifications. The letter T will stand for tonic chord, D for dominant chord, and S for subdominant chord.

No. 23.



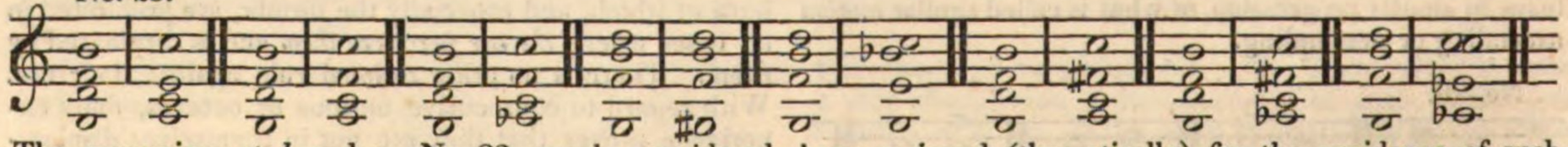
At *a* and *b* and *c* we have three progressions from T to D producing three imperfect cadences (see preceding section, *Melody*) of harmony and melody together. At *d*, *e*, and *f*, we have three other progressions from T to S, producing also imperfect cadences, but not so decidedly imperfect as those at *a*, *b*, and *c*. Indeed these last might, not improperly, be called *reversed* cadences. At *g*, *h*, *i*, we have three progressions the reverse of *a*, *b*, and *c*, and forming tonic cadences more or less complete. At *g*, the cadence is complete, from the third of dominant rising semitonically, in the upper Part, to the tonic itself. The cadence at *h* is less complete, from the fifth of dominant descending to tonic by a whole tone in the upper part; and at *i* the cadence is still less conclusive by the fifth of dominant rising by a whole tone to the third of dominant. At *g* and *h*, if the dissonance of seventh were added to the dominant, the determination of the complete cadence from D to T would be more striking.

No. 24.



A perfect cadence from the chord of the dominant seventh may be *interrupted* in various ways. The following are examples.

No. 25.

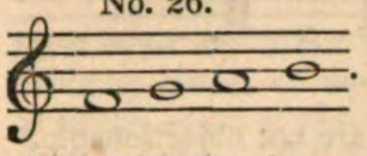


The successions at *k* and *m*, No. 23, may be considered as imperfect cadences, although in some cases, in ecclesiastical harmony, the cadence from the chord of the S to the chord of the T is used as a final cadence. The succession at *l* is an imperfect cadence, the most imperfect that occurs in the scale, if we except *n* and *o*.

The succession at *n* from S to D is used in ancient and modern music; but the contrary succession at *o*, from D to S, is very rarely attempted, on account of its harshness and striking discontinuity. No satisfactory reason has been assigned (theoretically) for the avoidance of such successions; nor why the progressions of common chords (properly managed) between the tonic and its second, ascending or descending by conjoint degrees, or between the dominant and the sixth of the scale, ascending or descending by conjoint degrees, should be frequently used with no displeasing effect. And, again, what *fundamental bass* can be assigned, according to received theories, to such successions as chords of sixth and third ascending or descending by conjunct degrees? Not to speak of many

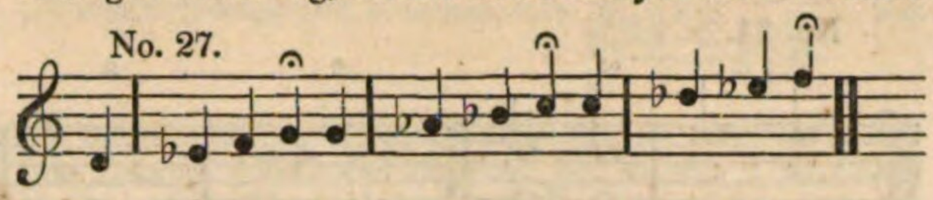
Music. more successions in harmony and in melody, quite inexplicable by the system of fundamental basses, commonly received as the true one. It may be remarked, that singers, in attempting to sing the ascending major scale, always find great difficulty at first in executing, in tune, the series of sounds from the fourth upwards to the seventh.

No. 26.



. This is a practical fact, not explained by any theory. If you give the learner (with a good ear) three of the ancient conjunct Greek tetrachords to sing in ascending, there is no difficulty in the intonation. Music.

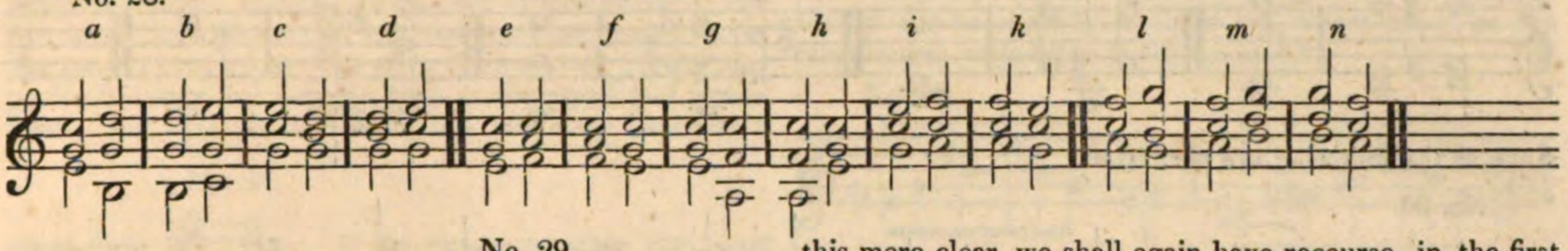
No. 27.



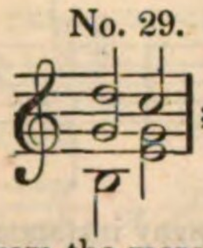
The ancient Greeks seem to have known more about fragmentary scales than our modern theorists do.

The partial inversions of the preceding successions of common chords are as follows:

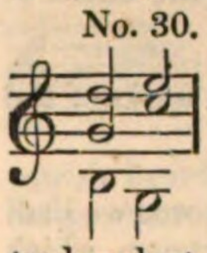
No. 28.



No. 29.

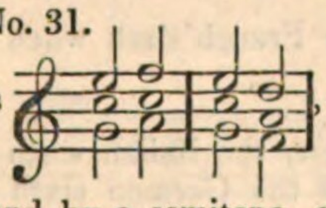
At *b* the progression *might* be  ; but such a passage is harsh in its effect, from the more natural progression of the third of the dominant being by a semitone ascending, instead of by a leap. Another harsh progression

No. 30.



might be (according to some composers) introduced at *b*. But such progressions ought in general to be avoided, though they sometimes occur in the free style of modern music; not, however, in the works of the best masters. It may be here remarked, that although the perfect fourth is a consonance, as we have said before, still, when it occurs between the bass and an upper Part, it requires a certain management. This is the reason why it has been erroneously called a *dissonance*. It would require a great many examples to show in what manner the perfect fourth should be treated when it occurs between the bass and an upper Part. We shall merely remark,

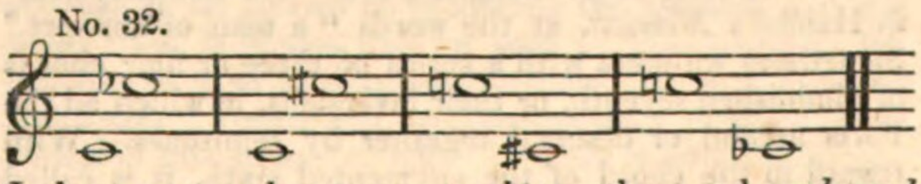
No. 31.

that, except in such successions as  , &c. the fourth must, in general, descend by a semitone, or a tone, to the third of the same bass sound; or, if the bass moves upwards or downwards to the following chord by a tone or a semitone, the sound forming the original fourth must either be continued in that following chord, or must descend a semitone or a whole tone. Such are the technicalities regarding the treatment of the fourth in harmony. The quantity of printed disputation regarding the nature, &c. of the fourth is most unreasonable.

A great deal of the variety and *colouring*, as it is called, of the free style of modern music depends upon the use of chromatic changes of the intervals of the simple common chords, and their inversions. To make the nature of this more clear, we shall again have recourse, in the first place, to the same successions of common chords that we have already given, and show how their forms and effects can be altered by means of these chromatic changes. Of course, it is not upon every occasion that these chromatic changes are to be used. Some clever composers of the more modern schools indulge in these chromatic alterations to such excess that many of their compositions are little better than continuous lamentation, or caterwauling. By such abuses, the manly simplicity, energy, and dignity of certain styles of music are entirely destroyed. The whole practical principle of these chromatic changes is the division of a tone into two smaller intervals, ascending or descending. We do not say "into two *semitones*," because that is not really the case in correct intonation of such passages. In a succession of chords such as we have given, one at least of the Parts may rise or fall by a tone to one of the Parts of the next succeeding chord. It is therefore obvious that an ascending or descending tone *may* be divided into two smaller intervals; and this is done by the chromatic alteration,—sharp in ascending, and flat in descending, as shown in Plate CCCLXXVI. Nos. 20 to 27 inclusive. We give these merely to show how the thing may be done. *When* such chromatic alterations may be introduced with good effect, is to be studied in the compositions of Haydn, Mozart, Clementi, Beethoven, and some others. All our examples of mere chords are to be considered by the student as no more than some of the dry and detached bones of a skeleton of harmony. He will find them all knitted together in their proper places, and clothed in living beauty of form and substance in the works of the best composers. It is *there* that he must seek for their use, and not in theories.

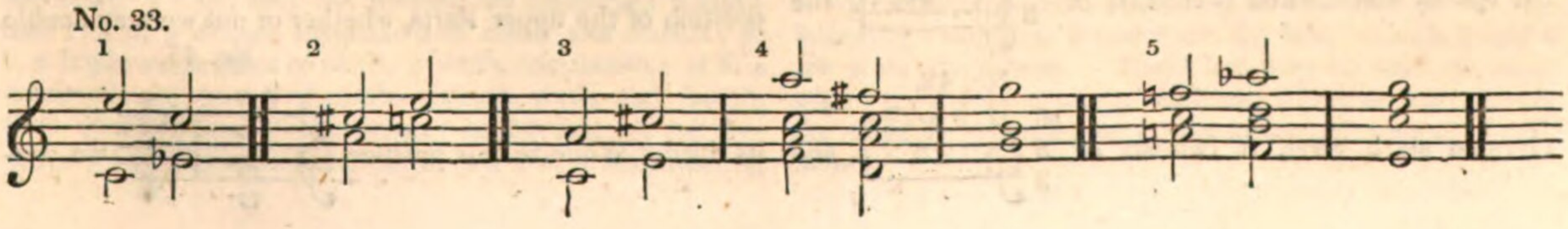
False relations must be avoided in melody as well as in harmony. When a sound passes to its diminished or augmented octave, above or below, there is a false relation in melody; as, False relations.

No. 32.



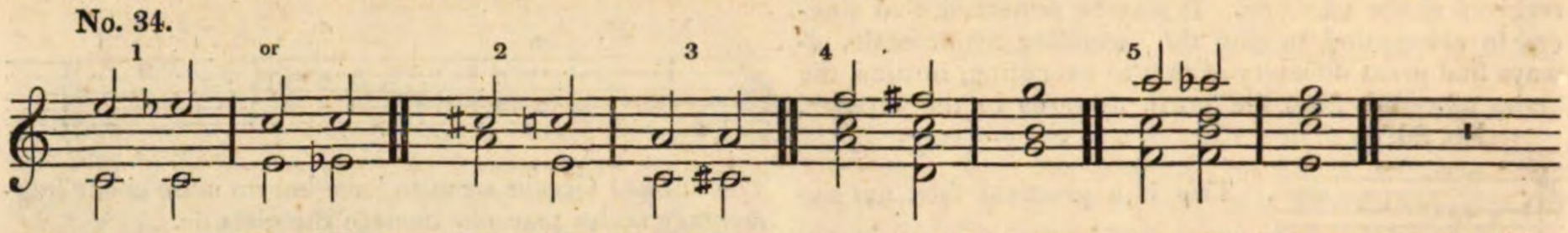
In harmony, such octaves struck together, and *prolonged for some time*, would be intolerable. Such passages as the following contain false relations.

No. 33.



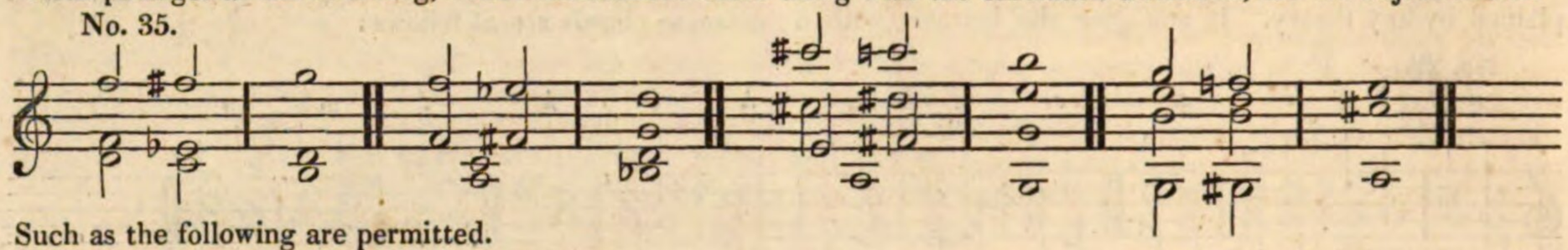
Music. In these passages, the chromatic alteration is not made in the same Part; hence arise the false relations, and their harsh effect. These examples, when corrected, will stand as follows:— Music.

No. 34.



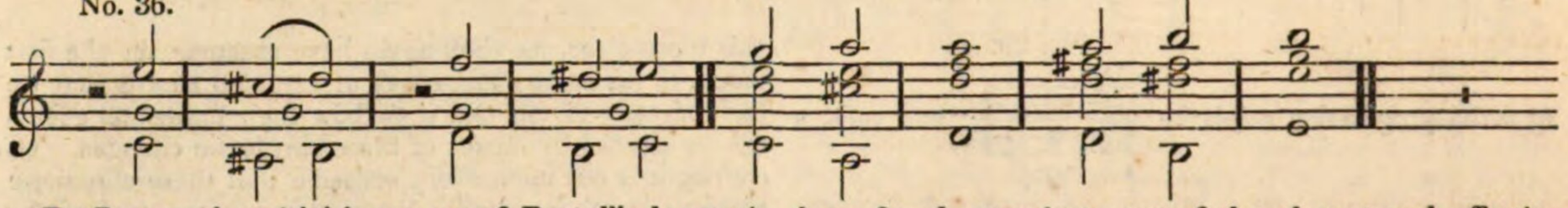
Such passages as the following, where dissonances occur along with the chromatic alteration, are not objectionable.

No. 35.



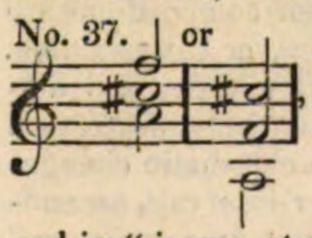
Such as the following are permitted.

No. 36.



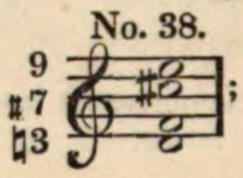
Dr Burney, in criticising some of Purcell's harmonic combinations, blames him severely for using the ♮6 and ♯3

No. 37. or



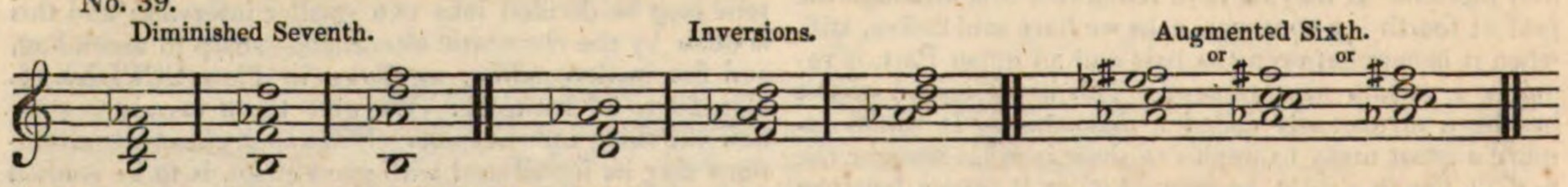
, and says that this chord is "*detestable*," and is "jargon at all times and in all places." It so happens that this same *detestable* chord is very frequently used in modern music; and, if Dr Burney had looked into the works of Emanuel Bach and Haydn, of which he speaks with unmingled commendation, he would there have found many instances of the elegant and effective use of the chord of ♮6 and ♯3; also in Mozart's works, both vocal and instrumental. Another chord that Dr Burney finds great fault with in Purcell, is the chord of

No. 38.



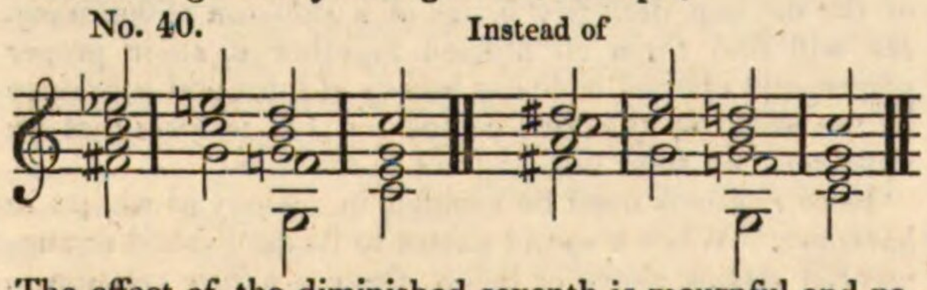
; but this chord is found in the works of the best modern composers. Among chromatic chords we shall notice only two more, of considerable importance, which frequently occur in harmony. They are the chord of the diminished seventh, and the chord of the augmented sixth.

No. 39.



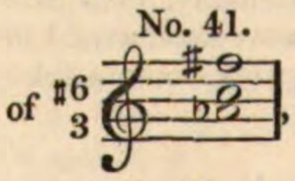
These chords occur more frequently in minor scales than in major ones; and when they do appear in the latter, the notation is generally wrong. For example,

No. 40.



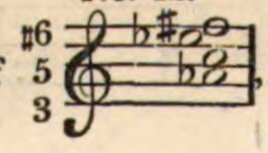
The effect of the diminished seventh is mournful and pathetic. Among other instances, see "He was despised," in Handel's *Messiah*, at the words "a man of sorrows." Sometimes we meet with a series of three or four chords of diminished seventh, or their inversions, in which all the Parts ascend or descend together by semitones. With regard to the chord of the augmented sixth, it is called

No. 41.

the Italian sixth when it consists of 

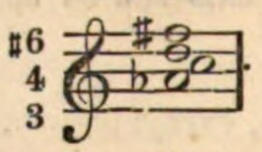
, the

No. 42.

German sixth when it consists of 

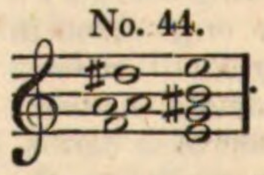
, and its third. When in this position

No. 43.

the French sixth when it consists of 

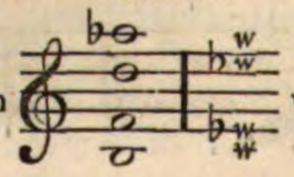
. Of these, the Italian sixth is the most simple and elegant, and the German sixth the most powerful in its effect. The French sixth is harsh and poor. In writing for four Parts, the third of the Italian sixth is doubled:

No. 44.



. The third and fifth of the German sixth are usually prolonged in the form of $\frac{♭6}{4}$ upon the next bass sound; but there are some exceptions to this practice. These augmented sixths are rarely inverted; but some instances are to be found in good composition. In the chord of the diminished seventh, it depends upon the position of the upper Parts, whether or not we may double its third. When in this position

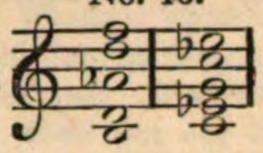
No. 45.



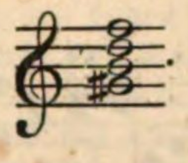
we can-

Music. not; but we may in the following position, where the diminished seventh occurs in a middle Part, and below the

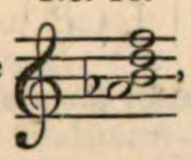
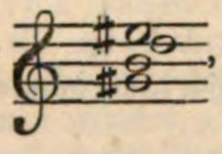
No. 46.

third  We have a few remarks to make upon what are called enharmonic changes of modulation, made by means of the chord of the diminished seventh, or of the chord of the German augmented sixth, or inversions of these. What is termed *enharmonic*, is really neither more nor less, in practice, than a change of signs in notation; which change, being merely addressed to the eye in all such pretended enharmonic transitions, leaves the sounds exactly as they were before upon all our imperfectly-tuned instruments, such as the organ and piano-forte. For example, we strike the following chord on a

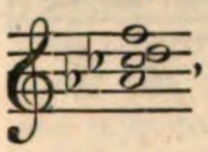
No. 47.

piano-forte  . If we choose to alter the signs

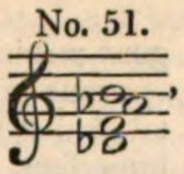
No. 48. No. 49.

of this chord, and to write  , or  , or

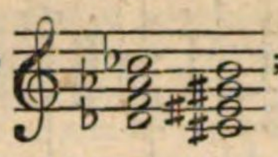
No. 50.

 , all this makes no change whatever in the sounds heard on the piano-forte. The very same sounds are produced, because the very same finger-keys are struck.

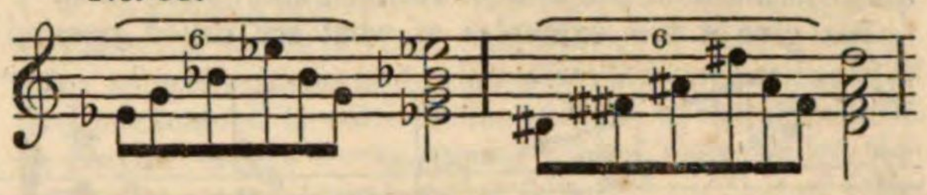
No. 51.

In the case of the German augmented sixth  ,

Music. No. 52.

we might change the notation into  ; but the sounds would remain the same on the piano-forte; so that the real differences between the sounds represented by these different modes of notation, cannot be made by such an instrument as the piano-forte, and therefore all pretended enharmonic changes and modulations upon it are mere delusions and non-existences. Again, to take a very plain case: Suppose that we were playing on the piano-forte a passage written in E♭, and that we chose to change the notation suddenly to D♯, where would be the enharmonic *modulation* in such a case?

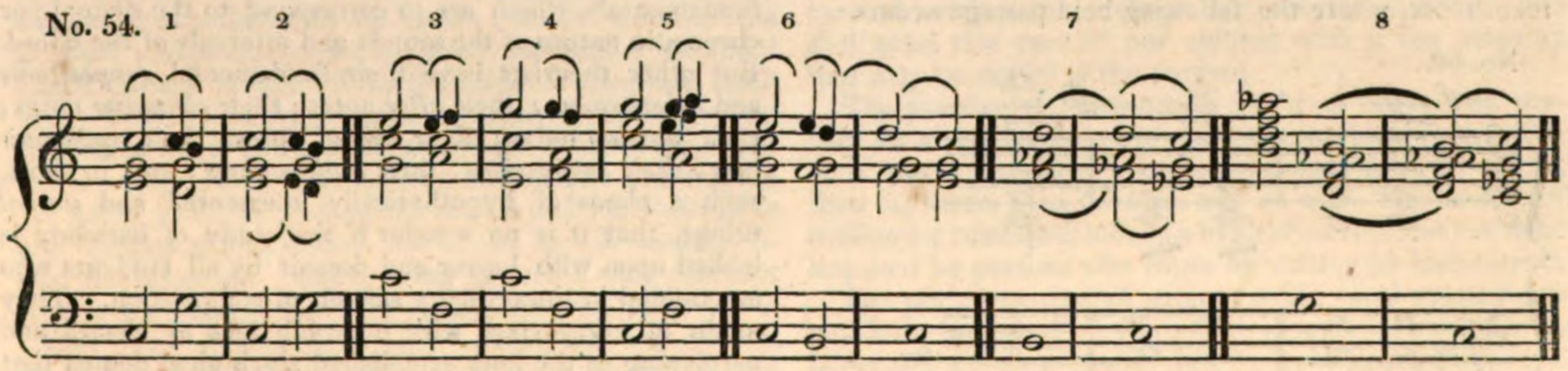
No. 53.



There is not the slightest difference of effect. A *real* enharmonic change in such a passage, if effected by voices or instruments in perfect intonation, would produce a very perceptible difference of pitch, and no agreeable result.

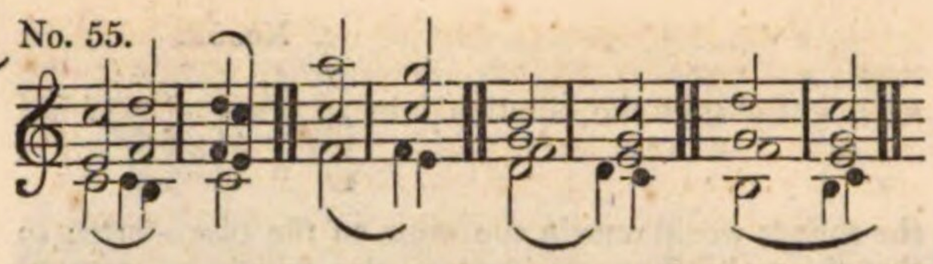
In passing from one chord to another, one or more of the parts of the first chord will (in compact harmony) ascend or descend by a tone, or a smaller interval, to one or more of the parts of the next chord that follows. The *prolongation* of one or more of these ascending or descending parts of the first chord, after one or more of the parts of the second chord has been introduced, gives rise to a variety of dissonances termed *suspensions*, or *syncopations*, and so on. These may be single, or double, or triple, or even quadruple. In order to make the nature of this part of our subject intelligible, but without entering into many details, we shall again have recourse to the successions of common chords already given in this section, and also to the chords of seventh, and of diminished seventh, and of diminished ninth.

No. 54. 1 2 3 4 5 6 7 8



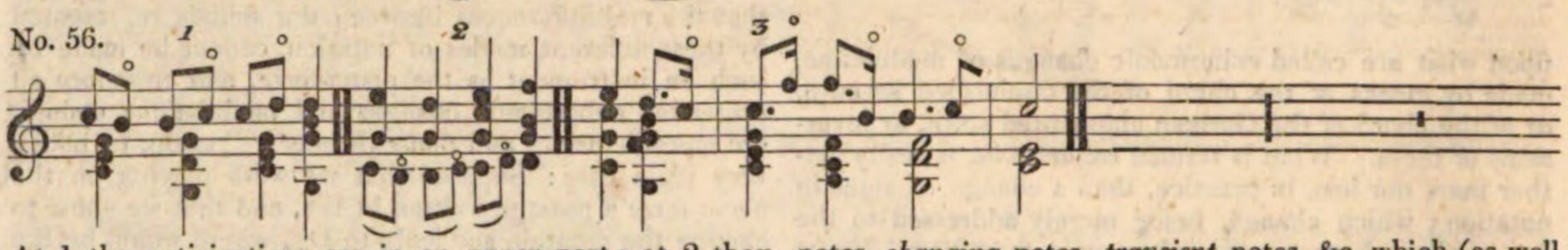
At 1 we have a single suspension, that of the fourth; and at 2, a double suspension of sixth and fourth. These are two of the cases formerly alluded to, in which the perfect fourth, though a consonance, is treated as if it were a dissonance when it occurs between the bass and an upper Part. At 3 occurs a single suspension, a major seventh ascending a semitone to its resolution in the octave; at 4, a single suspension of ninth resolving *downwards*, as the ninth almost always does, by descending a tone or a smaller interval, according to the nature of the passage in which it occurs; at 5, a double suspension of ninth and major seventh, in which the ninth is resolved by ascending a tone, and the seventh by ascending a semitone; at 6, a double suspension of ninth and fourth; at 7, a triple suspension of ninth, ♭ sixth, and fourth; at 8, a quadruple suspension of ninth, seventh, sixth, and fourth. Such combinations of dissonances as this last are not frequent; but they sometimes occur in the best instrumental compositions. This *legato* and *syncopated* style belongs more to the old schools of composition than to the modern. The effect of such passages is good on the organ as an accompanying instrument, or as a principal instrument, on account of its powers of producing the *sostenuto* and the *legato;* but is almost null on such an instrument as the piano-forte, from its deficiency in these powers of *sostenuto* and *legato*. Voices and wind-instruments produce great effects in this style of music. It is not so effective in music for stringed instruments. Besides a great variety of suspensions that may take place in an upper Part, there are many that may occur in the bass when its progression is by conjunct degrees ascending or descending. Of the following examples, 1 and 2 are the best, though 3 and 4 are from Beethoven. These last may be used in cases where the combinations of different voices or instruments are suitably arranged, or in the course of a rapid movement.

Music. No. 55. Music.



The nature of what are called *anticipations* (the converse of *suspensions* or *retardations*) will be understood from the following examples.

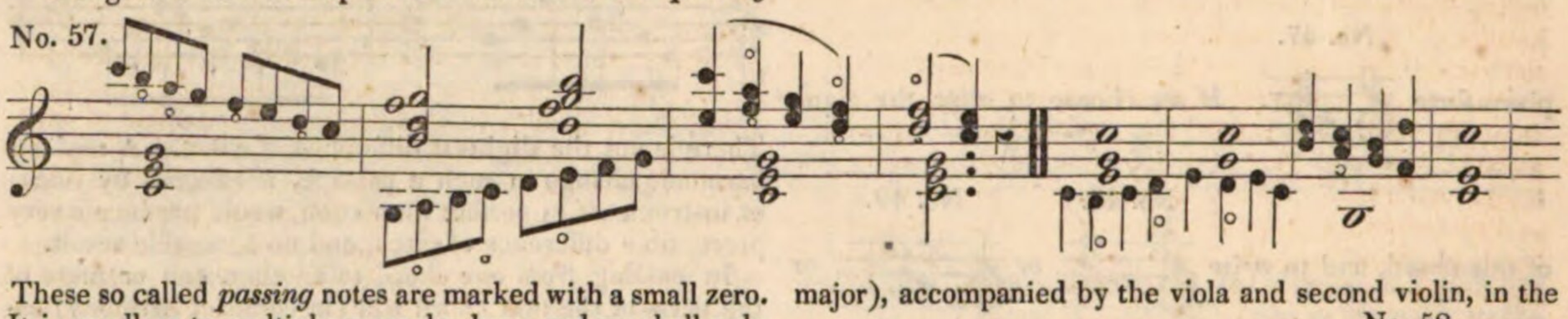
No. 56.



At 1 the anticipations are in an upper part; at 2 they are in the bass. Anticipations such as those at 3 are frequent in music of the time of Handel, and before then.

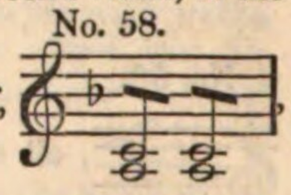
We give a few examples of what are called *passing* notes, *changing* notes, *transient* notes, &c. which (as well as suspensions and anticipations), are said by theorists to be *unessential* or *accidental* notes.

No. 57.



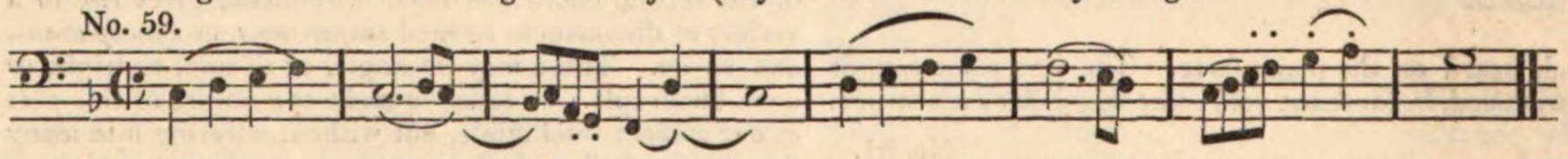
These so called *passing* notes are marked with a small zero. It is needless to multiply examples here, and we shall only refer to one remarkable instance of the use of *passing notes*, which occurs at the beginning of the first movement of the first quartett in Beethoven's fifty-ninth work. The violoncello begins with a fine and dignified subject (key F major), accompanied by the viola and second violin, in the following manner for six bars and a half,

No. 58.



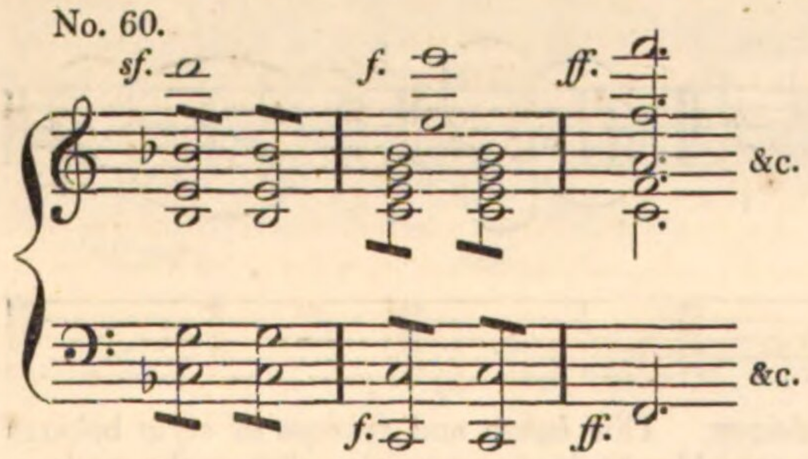
when the harmony changes.

No. 59.



The first violin comes in at the ninth bar, imitating the preceding passage of the violoncello, and accompanied by the three other instruments forming the chord of the second inversion of dominant seventh, as far as the seventeenth bar, where the following bold passage occurs.

No. 60.



With regard to *passing* notes, notes of *grace*, *anticipations*, *substitutions*, *altered* or *chromatic* notes, and so on, the truth seems to be, that theorists have always found them inexplicable upon their favourite principle of the fundamental bass; and that, not knowing how to account for them rationally upon that principle, they have been obliged to treat all such sounds that occur in melody and in harmony as sounds that have no foundation in the *real* structure of the composition; and to assign to them, by way of salvo, any names that might pass current in an obscure and erroneous terminology. But if theorists *will* adhere to the received systems of fundamental basses, they ought to be able to apply these systems to *all* the phenomena of melody and harmony. This is not the case; for it is utterly impossible to refer *all* the combinations of modern (or even of ancient) harmony, to the received systems of fundamental basses. Every candid and intelligent musician will admit this to be true. Among all the systems of fundamental basses, Serre's theory (formerly alluded to) seems the most plausible, although still very imperfect. He assigns to a chord, one, or two, or three fundamentals, which are to correspond to the diatonic or chromatic nature of the sounds and intervals of the chord. But other theorists have their fundamental *suppositions* and *substitutions;* their *after* notes; their *changing* notes; their *passing* notes; their *altered* notes; their *appoggiature;* their *suspensions;* their *anticipations;* and, in short, such a chaos of hypothetically unessential and *unreal* things, that it is no wonder if the study of harmony is looked upon with horror and despair by all students who are trained in the ordinary schools of composition. They meet, at every step, with contradictions as absurd and perplexing as the long established algebraical dogma that there are *quantities less* than *nothing*. A little common sense and logic might have shown that this puzzling dogma is a mere contradiction in terms. *Nothing* being *no quantity* at all, it is obvious that there can be no such thing as a *quantity less* than *nothing*, or even *equal* to *nothing*. If such absurd contradictions in terms pass so long current in the most severe and exact of all sciences—mathematics—it cannot surprise any thinking man that musical theories and systems should abound in similar ones.

It is wrong to say that the *ear* recognises or suggests what are called *suppositions* and *substitutions* in fundamental basses; sounds that are not heard, but are ascribed, by erroneous theory, to such and such chords. The ear hears none of these imaginary and hypothetical things. Were it otherwise, and to carry this hypothesis to the *reductio ad absurdum*, the ear ought to hear all the chords that can possibly be applied to the accompaniment of any given melody. In fact, if two voices, or two instruments, perform a duett, for example, the lower Part is

Music. felt to be the bass for the time being; and there is no other Part felt, or *supposed*, or *substituted*, by the ear. The imagination may suggest an additional Part below the lower Part, or above the higher Part, or intermediate; but this has nothing to do with the theory of the fundamental bass. If another lower Part is added to this same duett, then the ear feels *that* Part to be the bass; and supposing a fourth or a fifth Part, and so on, added still lower, then such added Part becomes the bass, in so far as the ear is concerned. If the lowest Part is overpowered by the upper ones, then the ear pays no attention to it, but to the predominant upper or middle Part or Parts. Experiment will prove this. If a melody is performed by a single voice or instrument, or by a great number of voices or instruments in unison or in octaves, does the ear supply a fundamental bass, or any bass at all? Surely not. As to what are called *passing* notes, chromatically *altered* notes, *suspensions*, *anticipations*, and so on, in melody or harmony; all these *sounds* are just as *real* as any other sounds that are heard in the course of the melody or of the harmony; and if theorists adhere to the received fundamental bass system, then *every* sound that is heard in a melody, or in any Part of a harmony, must have its own fundamental bass, just as much as *any other* sound that exists in the melody or the harmony. This inference is inevitable from rational logic. One of the most absurd hypotheses in musical theories is found in the attempt to explain, according to the fundamental bass system, a series of chords of 6th and 3d ascending or descending by conjunct degrees. It is said that in such passages there is an *ellipsis* of a chord between every two chords of the series, and that the ear understands this to be the case, and supplies the omitted chords!

When musical theorists meet with passages that cannot be explained by the hypotheses advanced, such passages are called *licences*. Unfortunately these *licences* are so numerous in music, that the rules are overwhelmed by exceptions. The easy way for a puzzled system-monger to escape from the difficulties that beset him is, no doubt, to have recourse to such convenient words as *licences*, *exceptions*, and so on, which are not unwillingly received by the public as substitutes for truth. In the works of the greatest composers are found many passages of excellent effect, though prohibited by the rules of theorists. Such being the case, we would again earnestly urge the student to form an extensive acquaintance with the best models of the art, rather than trust to any theories on the subject. He ought never to give up his reason and his feelings to any theoretical authorities. If he do, he will become timid and uncertain. Every thing he meets with different from what his dry rules have taught him, will perplex and terrify him. His energies will be paralyzed, and he will be incapable of producing any thing but cold, feeble, and formal music. To escape this result, he must take a comprehensive view of the art and its accessories; devote himself to no particular composer or school of composition; study the best music of every kind and of every country; and not allow himself to be captured and manacled by any theorist. He ought to keep in view that, in music, nothing is out of rule except what offends the ear, the taste, and the judgment; but that he must not venture to imitate the freedom and the bold effects of the greatest masters, until he has acquired great knowledge and command of the materials of the art. This cannot be acquired but by a well-directed course of study. Young painters are generally ambitious of handling the brush and colours before they have learned to draw correctly with a pencil or a crayon. If they are permitted to follow this course, they never attain eminence in their art. The case of the impatient musical student is analogous. Before he has learned to write correct melody, or correct harmony for two voices or two instruments, he burns to signalize himself by writing a chorus or a symphony, an opera or an oratorio. The lamentable failure of such a premature attempt disgusts and disheartens him. He abandons study as hopeless; and, if a man of genius, deprives the world of an excellent composer by neglect of the old maxim, *festina lente*. It is well to remark here, that Haydn, in the height of his reputation, declared to his friends that he did not recollect having passed a day without working sixteen and sometimes eighteen hours. We may also remark, that Haydn formed his own admirable style by the indefatigable study of every good composition within his reach; by neglecting no opportunity of gaining information regarding his art; and by forming for himself his own theory and principles of musical composition. In the earlier part of his life he studied intently the works of C. P. E. Bach, a musician of the highest order of genius, and also the works of G. B. San Martini of Milan, a composer of great genius and originality, but not possessed of patience enough to cultivate his abilities to the uttermost. In Haydn's earlier works, among others, some of his Sonatas, the resemblance between his style and that of Emanuel Bach is most striking. Indeed, the two styles are hardly distinguishable. But, as his musical horizon extended, he saw that neither E. Bach, nor John Sebastian Bach the father, nor G. B. San Martini, nor many more whom he studied and imitated, would suffice to make him a great and original composer. So he applied himself to the improvement of instrumental music, and to the invention of a new style of composition in instrumental quartetts and symphonies. His best quartetts and symphonies still remain unrivalled, for the admirable management of the subjects and modulations, the judicious employment of the different instruments, the unity of design in each movement, and the clearness of construction and of harmony. Haydn was a great advocate for melody. He used to say, "Every composition that has a fine melody is sure to please;" and experience proves the truth of Haydn's assertion. He was of opinion that the most *recherché* and learned harmony without melody was only an elaborate noise, which, if it did not displease the ear, excited neither the feelings nor the imagination. We shall close this part of our subject with a few remarks that may be useful to the student. Music.

The practice of composition ought to begin with melody for a single voice, with or without a bass Part. The next step is to learn to write correctly for two voices, then for three, then for four, and so on. The custom of writing for voices will induce a habit of correctness not to be acquired by persons who begin by writing for instruments.

The proper manner of accompanying vocal music forms a difficult branch of the art, and cannot be studied with advantage till considerable skill has been acquired in vocal composition. The compass and quality (*timbre*) and powers of different instruments, and their effects in combination, must now occupy the student's attention. He ought to take every opportunity of hearing good instrumental music well performed, not only by orchestras, but also by military bands; and of observing attentively the various effects produced. In whatever he composes, clearness of harmony ought to be carefully preserved. Obscurity of harmony arises from the following causes: Too rapid a succession of sounds, chords, and keys; a complication of different movements that take place simultaneously in the different Parts, especially when these movements are at the same time accompanied by a series of chords that succeed each other very quickly, or by sudden modulations. Two different movements at the same time, unite easily; three not so easily; four may produce obscurity, if they are not very skilfully arranged, and especially if care is not taken, at the same time, that the chords do not suc-

Music. ceed each other, but at the distance of a bar at least. More than four different movements at once almost inevitably produce confusion. It is therefore mere waste of time to attempt to give a different movement to each of the Parts of an orchestra. Harmony for three, and especially for two Parts, is much less liable to become confused than harmony for more than three Parts. For this reason, harmony in two or three Parts should be frequently used, particularly in music written for the public. Besides clearness of harmony, there is another kind of clearness not less important. It depends on the choice of ideas, and the order in which they are connected. Wherever there is neither *unity of ideas*, nor *proportion*, nor *symmetry*, there is confusion.

That excellent composer Piccini, the rival of Gluck and of Sacchini, occasionally employed full and rich harmony in his orchestra, but disapproved of the common practice of keeping all the instruments continually busy. He wished to make the voice the principal Part in his operas, and that the instruments should only sustain the voice, or express what was indicated by the words, or by the action of the persons of the drama, or by the place and circumstances of the scene. He was opposed to those *disegni ostinati* in the accompaniment, which Jomelli brought into fashion, and which are uniformly prolonged through nearly the whole extent of a piece of music, although the words present shades of feeling or ideas which would require corresponding shades in the accompaniment. Multitudes of different instruments, continual orchestral effects, crude masses of harmony, and a perpetual affectation of dissonances, were considered by him as musical monstrosities. He said, "It is not difficult to know what can be put into a harmony. The difficulty lies in knowing what should be left out. The four Parts for stringed instruments, which form the basis of the orchestra, lend themselves almost equally to every kind of expression. This is not the case with the wind instruments, and instruments of percussion. The expression of the oboe differs from that of the clarinet, and that of the clarinet very much from that of the flute. The horns change their expression according to the key in which they are used. The bassoon, whenever it is not confounded with the bass, becomes sad and melancholy. The trombones can express nothing that is not lugubrious. The trumpet, nothing that is not warlike and brilliant. The kettle-drum is altogether military. If each of these instruments were reserved for its proper employment, we should produce varied effects, succeed in describing every thing, and continually diversify our musical pictures. But we are lavish of all these means, all at once, and always. We exhaust and harden the ear. I should like to know what we shall do to awaken it when, as will soon happen, it will be accustomed to this uproar. What new *diablerie* shall we contrive? Perhaps we shall then wish to return to nature, and to the true means acknowledged by art; but you know what happens to persons accustomed to drink brandy." Some combinations of harmony, and treatments of dissonances, &c. not explicable by common theories, will be found in Plates CCCLXXVI. CCCLXXVII. No. 28 to 71.

Modulation. We mentioned, in the section on Melody, that a treatise on melodic modulation is wanted; and we think that a satisfactory treatise on the modulation of harmony is also a desideratum. But neither can be written to any good purpose in the present state of the theory of music, taking the word theory in its most comprehensive sense, as applied to this art. Philosophers seldom understand music; and the greatest practical musicians have neither leisure nor inclination to attempt to analyse its nature; so that, for want of properly conducted investigation, we are likely to remain in the same "aere senza stelle" which at present darkens the depths of the art. Music.

Modulation signifies, properly, the regular constitution of melody and of harmony in any given key, but is *commonly* used to express the art of conducting a melody or a harmony from one key into another, or through several successive keys. This change of key might be more properly called *transition*. Many persons believe that there can be no modulation where there is no change of key. But this is an error, since modulation takes place even in the simplest melody confined to one key. Transition is only one kind of modulation, and is worthless if injudiciously employed. We may make a transition from one key to another suddenly, and without any intermediate sounds; or by means of one or more intermediate chords through which we modulate into the new key.

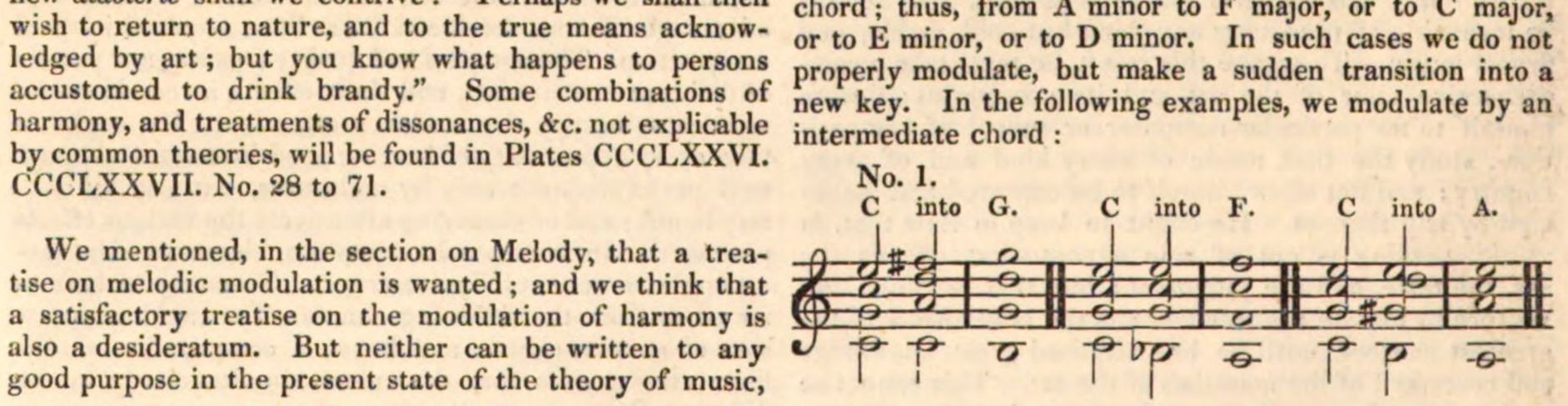
The art of good modulation from one key to another, consists in the choice of these intermediate chords, and in their relative durations. The use of sudden transitions from one key to another, without any intermediate chords, requires attention to a variety of circumstances, in order to produce a good effect. Such transitions should be but sparingly employed in any regular composition. Every regular piece of music is composed in a particular key, in which it begins and ends, and which generally predominates over all the other keys that may happen to be introduced in the course of the piece. If the key is major, what are called its relative keys will be two major ones and three minor. If a minor key, its relative keys will be three major ones and two minor. The following tables will show what these relatives are:—

C major, principal key.	A minor, principal key.
D minor, first relative key.	C major, first relative key.
E minor, second relative key.	D minor, second relative key.
F major, third relative key.	E minor, third relative key.
G major, fourth relative key.	F major, fourth relative key.
A minor, fifth relative key.	G major, fifth relative key.

These six keys offer, in their modulated connection, 720 combinations. The nearest related keys to a major key, taken as principal, and into either of which it may easily pass without any intermediate chord, are its dominant, its subdominant, and its sixth; thus, from C major to G major, or to F major, or to A minor.

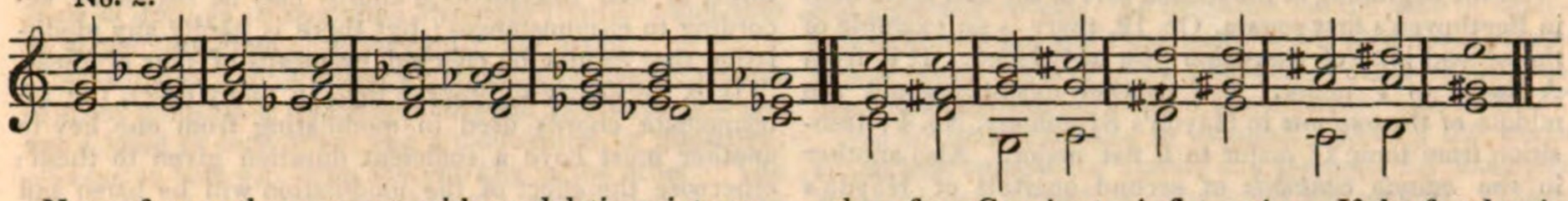
The keys most nearly related to a minor key, are its third below or above, or its dominant, or its subdominant. It may pass into any one of these without an intermediate chord; thus, from A minor to F major, or to C major, or to E minor, or to D minor. In such cases we do not properly modulate, but make a sudden transition into a new key. In the following examples, we modulate by an intermediate chord:

No. 1.



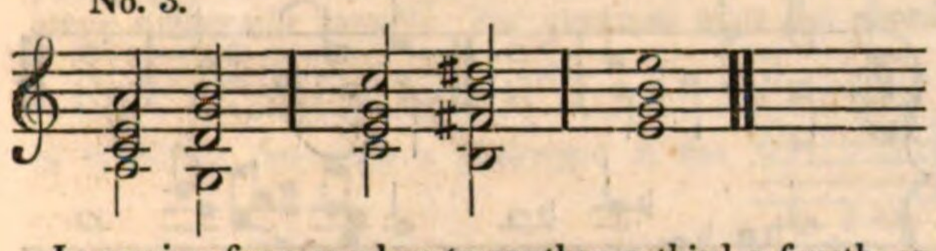
Music. The general rule is, that we can *modulate* into a *relative* key by means of one single intermediate chord, which chord is the dominant seventh, or some inversion of the dominant seventh, of that relative key. We may remain in the new key for some time, or we may quit it immediately, and modulate into a third key, and so on. An example of rapid modulation from key to key by means of intermediate dominant sevenths, or their inversions, occurs in what is called the "Tour du Clavier," or harmonic circle of keys. It is needless to give more of this than a fragment by way of example, since long successions of the kind are not used in modern music. Only short passages of such modulation occur in the best modern compositions. Music.

No. 2.



Not unfrequently we meet with modulations into relative keys brought about by means of an intermediate common chord. For example:

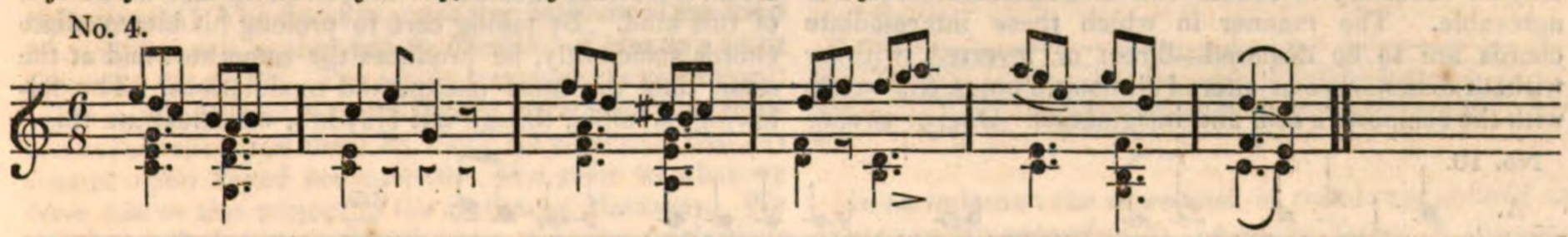
No. 3.



In passing from one key to another, a third, a fourth, or a fifth below, without using any intermediate chord, it is proper to keep in view the following remarks:—1. Transition to third below. In this case, if the former key is major, the second should be minor. For example, C major, A minor. Here the transition is to the minor third below. A bolder and more unusual transition is from one major key to another major key, a major third below; such as from C major to A flat major. If the first key is minor, the second key should be major. Thus, from C minor to A flat major, a major third below. 2. Transition to the fourth below. The two keys ought to be both minor or both major, otherwise they will not be relative. 3. Transition to fifth below. The two keys ought to be both major or both minor, for the same reason that has just been given. To make a real change of key without intermediate chords, we must introduce at least one entire phrase or period in the new key. (See *Melody*, for *phrase* and *period*.) Thus, after a subject in C major, we might introduce a period in G major, in F major, or in A minor, and afterwards return to the key of the subject. Sometimes, but much more rarely, a transition is made from a given key to another a major second or a minor third above it.

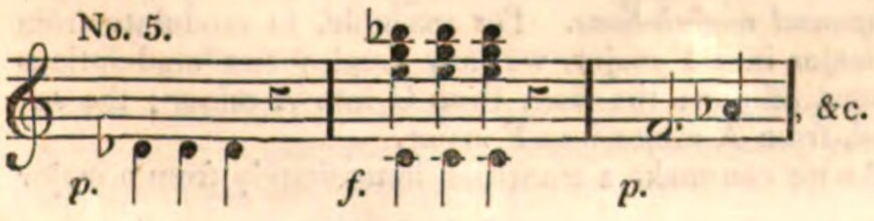
The following is an instance of the first kind of transition just mentioned.

No. 4.



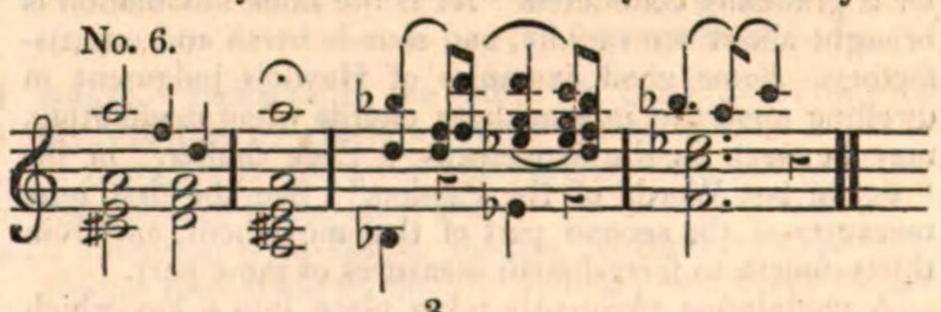
In the case of a transition from one key to another a minor third above it, the first key must be minor and the second major; for instance, from A minor to C major. This kind of transition is found in certain short pieces of music, and, among others, in some Russian airs. Another transition (if so it may be called) which is not unfrequent, occurs when we change the mode without changing the key; for example, when we change C major into C minor, or the converse. We may pass immediately from a major key into a minor key its fifth below; for example, from C major into F minor. Again, after making a cadence upon the dominant of a minor key, we may proceed immediately to the key of the major third below that dominant, or to the key of the minor second above that dominant. For example, from dominant common chord of C minor, we may make a transition into the key of E flat major, or of A flat major. Of the former kind of transition a very beautiful example occurs in the *Adagio sostenuto* in Haydn's second quartett, Op. 16, where, from the dominant common chord of C minor, the change of key is made into E flat major. Also another in the "*Hodie mecum*" of Haydn's "Seven last Words of the Passion," at the 21st measure of the movement. In the same movement, at the beginning of its second section, a very effective modulation occurs from E flat major into F minor, by means of the following passage.

No. 5.



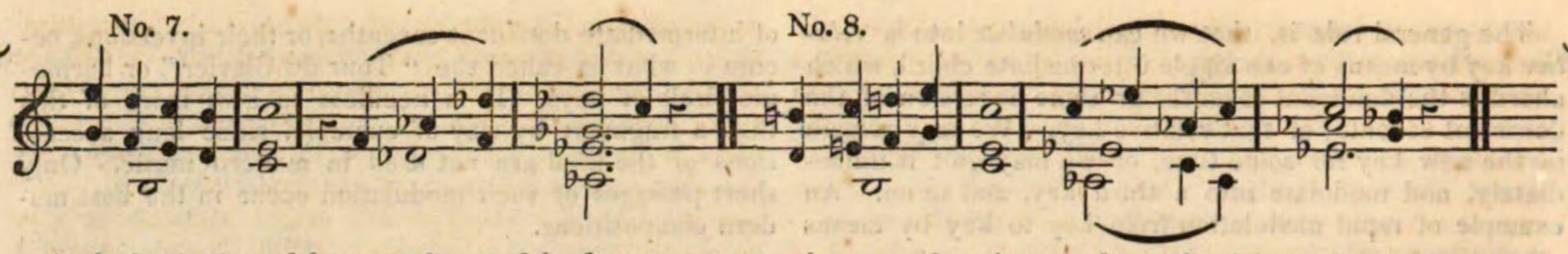
Examples of transition from the dominant common chord of a minor key, to a major key a minor second above that dominant, as at No. 6 below, may be found in the works of Haydn, Mozart, Beethoven, and other composers. An instance may be seen in the Finale to Haydn's Symphony, No. 5 (about the middle of the movement), where the transition is from dominant of F sharp minor to the key of D major. In the "Trio" of the first quartett in Beethoven's Op. 18 there is an example of a transition from the dominant of F major into the key of D flat major. In the sixth measure of the first movement of Beethoven's quartett, Op. 95, we find a very singular transition from the dominant of the key of F minor into the key of G flat major.

No. 6.



In the *allegretto vivace* $\frac{3}{8}$ in the first quartett of Beethoven's Op. 59, there are some curious transitions. Near the beginning there is a transition from the dominant of B flat major to the key of A flat major, and from the dominant of this last key a transition to the key of C flat major. Sometimes, in order to produce a powerful effect of contrast, a transition takes place directly from the tonic of a major key to the major key a semitone above, or a major third below. For example, from C major to D flat major, or to A flat major.

Music. No. 7. No. 8. Music.

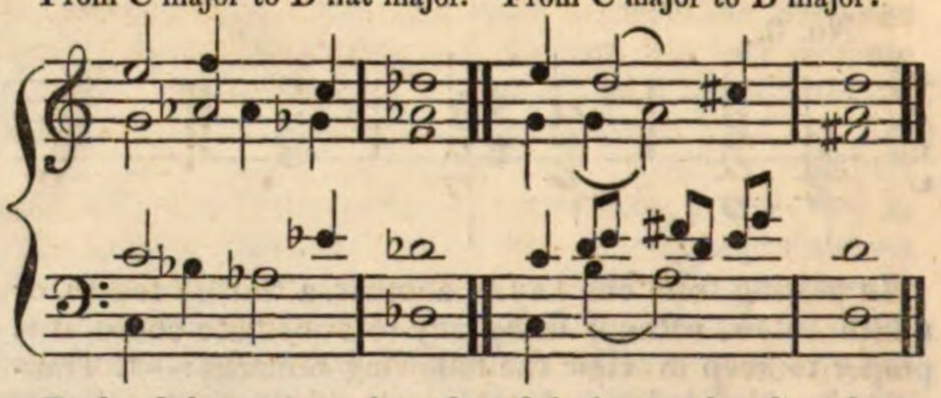


At the beginning of the second part of the first movement in Beethoven's first sonata, Op. 12, there is an example of the second kind of transition just mentioned. It is from A major to F major. See another example about the middle of the *andante* in Haydn's Symphony, No. 4; transition from tonic G major to E flat major. Also another in the *adagio cantabile* of second quartett of Haydn's Op. 72; transition from E major to C major. All such powerful contrasts as those we have just spoken of, especially the transition from a given key to another a semitone above, ought to be very sparingly used. In dramatic music, and symphonies for an orchestra, these transitions may be very effective. The judicious composer may occasionally introduce them in music of a different description; for instance, in a cantata, or an instrumental quartett or quintett, &c. Excepting the cases we have mentioned of transitions made from one key to another without any intermediate chords, the general rule to be followed in modulating is to connect together the different keys by intermediate chords. In the proper selection of these intermediate chords consists the art of modulation taken in its widest sense. It depends entirely upon the relation or non-relation between the keys from and into which we modulate, what number of intermediate chords may be necessary to render the modulation smooth and agreeable. The manner in which these intermediate chords are to be disposed—direct or inverted, with or without dissonances or altered chromatic notes, &c.—rests with the composer's skill and imagination. One, or two, or three, or four intermediate chords may be necessary, according to circumstances; but there is hardly any modulation that cannot be effected by means of four of these.

It is necessary to observe that, in many cases, the intermediate chords used in modulating from one key to another must have a sufficient duration given to them; otherwise the effect of the modulation will be harsh and displeasing.

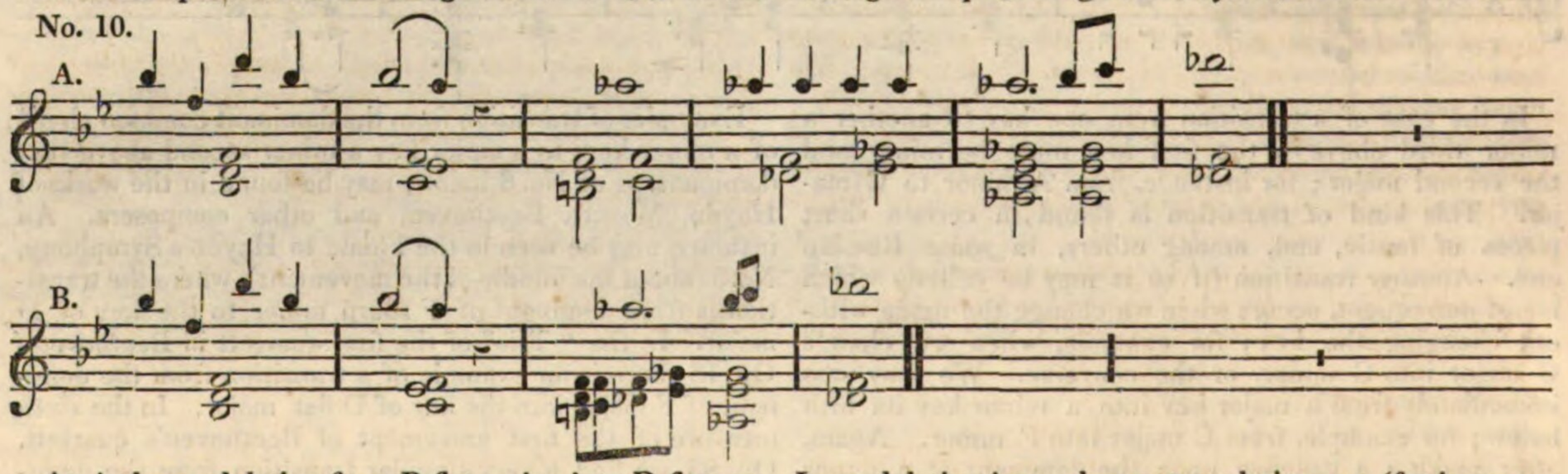
No. 9.

From C major to D flat major. From C major to D major.



Both of these examples of modulation are harsh and unpleasing, because the intermediate chords are too few, and have not sufficient duration allowed to them; and yet they are given in a set of elaborate tables for modulation by Hudl, a German musician. Haydn never falls into errors of this kind. By taking care to prolong his intermediate chords sufficiently, he produces the smoothest and at the same time the most unexpected modulations. The following example, though not Haydn's, will illustrate this:

No. 10.



At A the modulation from B flat major into D flat major is gradually conducted. At B the same modulation is brought about too rapidly, and sounds harsh and unsatisfactory. Some good examples of Haydn's judgment in dwelling upon the intermediate chords when modulating, may be seen in the movement "Ecce mulier," in his "Seven last Words of the Passion." See the first nine measures of the second part of that movement, and from thirty-fourth to forty-fourth measures of same part.

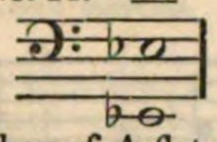
A modulation frequently takes place into a key which is not a relative one to that immediately preceding, though both are related to the principal key of the piece. For example: 1. When the principal key is major, a modulation may occur from the second of the key to the third, from the third to the fourth, from the fourth to the fifth, from the second to the fifth. 2. When the principal key is minor, we may modulate from the fourth degree to the fifth, from the fifth degree to the sixth, from the sixth degree to the seventh, from the fourth degree to the seventh, and the converse of all these cases. In modulating into a key not are lative one (for instance, from G major into F major), care must be taken that the two keys are relatives to a principal key which has previously been sufficiently established; for it is only in such case that a modulation of that kind can be suitably employed. One may easily modulate from G major into F major by means of two intermediate chords in a piece of music of which the principal key is C major or A minor; but one could not do so if the principal key were D major or E minor; so that a modulation which is good in one case may become bad in another. This must always be kept in view with regard to modulations of the kind just mentioned. In order to modulate smoothly into a key more or less remote from the one we quit, we may employ two, three, or four modulations instead of one only. These may be called *compound modulations*. For example, to modulate from G major into F major, we may employ two modulations instead of one; the first, from G into A minor; the second, from A minor into F major.

As we can make a transition immediately from a major

Music. key to the minor key of its fifth below, so we can modulate into all the relative keys of the latter in setting out from the former; for example, into all the relative keys of F minor, beginning to modulate from C major. Again, we can modulate into all the relative keys of C minor, in setting out from C major. It is easier to modulate into keys that increase the number of their flats, than into keys that increase the number of their sharps. For instance, it is more difficult to modulate smoothly from C major into A major, than from C major into A flat major.

Sometimes, instead of using intermediate chords, a pause of some duration is employed between two keys that are not related to each other, and a modulation, or transition, effected in this way from the one key to the other. The longer the pause, the smoother the modulation in such cases. A single prolonged intermediate sound, not a *chord*, placed between two keys not relative, and followed by a pause, may also render the transition from the one to the other sufficiently smooth. For instance, after the chord

No. 11.



of G minor, introduce a prolonged E flat and a pause, and then pass at once into the key of A flat major. Towards the end of the last movement of Beethoven's third Piano-forte Trio, Op. 1, there is a curious modulation from dominant of C minor into B minor by means of two prolonged sounds, G and F♯. We may modulate from one key to another far remote, by means of a series of chromatic notes performed by one Part that seems to wander uncertain in quest of something. "Or su, or giù, ed or ricirculando." The finest example that we know of this kind of modulation is in the *Adagio Fantasia* of Haydn's sixth Quartett, Opera 76. The whole movement is charming.

As to what are called *enharmonic* modulations, or transitions, we shall pass them by, since they have no real existence upon keyed instruments. We refer to what we have said on this subject in the section on Harmony. We must remark, however, that they are dangerous delusions, and are continually giving rise to a number of harsh and intolerable pseudo-modulations in the music of young composers, and even in the music of experienced composers who ought to know better. No sooner has a young composer (not wisely taught) got acquainted with the *formulæ* of these pseudo-enharmonic transitions, than he is eager to use them on all occasions, in order, as he thinks, to display his learning. He deceives himself, for his indulging in such things only betrays his ignorance of his art. "Modulation," said Piccini, "like all the other processes of the art, ought to be employed as a means of just expression and judicious variety. To modulate for the sake of modulating, is to prove one's ignorance of the object and principles of music. It is to affect a superabundance of imagination and of knowledge, in order to conceal the want of both."

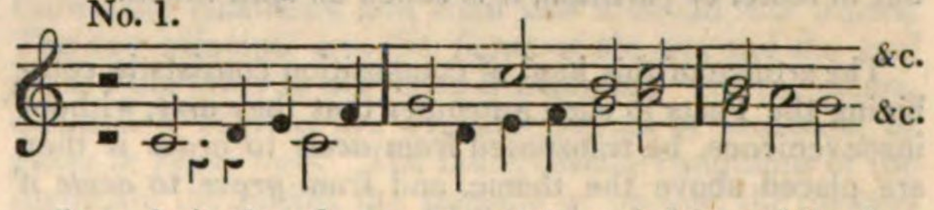
Music.

We advise the student to examine carefully the works of the best composers, Italian and German, for examples of modulation, as well as of harmony and melody. There is no other way for him to acquire even a respectable knowledge of his art. As to the books published expressly upon modulation, some of them are written by Germans, and generally contain only mere *formulæ* of the shortest ways in which modulations can be effected. These formulæ the student ought to shun, except for mere reference; because, although the study of them might render him able to modulate in a dry and formal manner, they could never teach him that grace, and freedom, and effect, without which the most elaborate modulations are worthless.

Imitation is a musical artifice, by which a Part, called the *antecedent*, proposes a subject, or melody; and another Part, called the *consequent*, repeats the same melody, after some rests, in any given interval, and so continuing to the end. Imitation, canon.

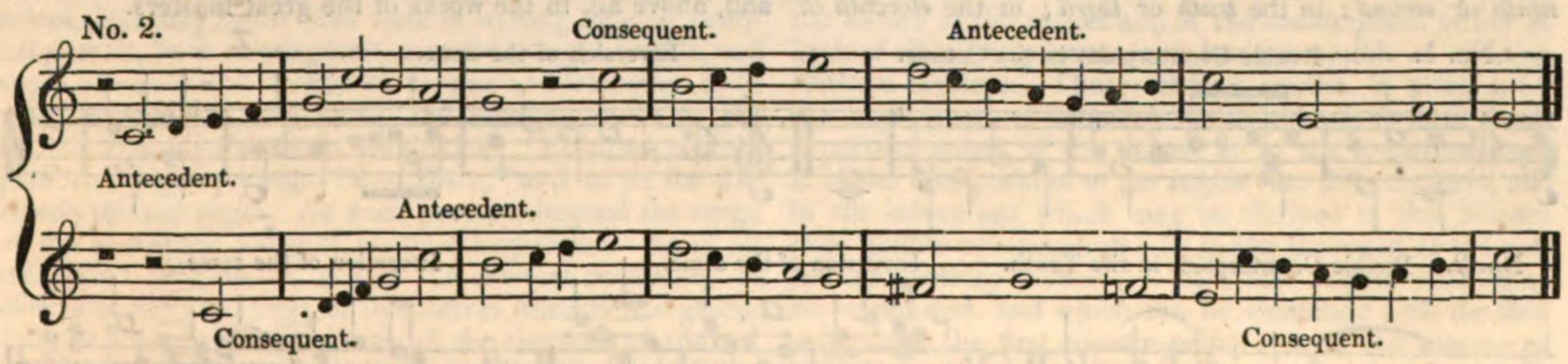
Example. Imitation in the Unison.

No. 1.



In an imitation the *consequent* is not always obliged to answer to the *antecedent* in the whole extent of the subject proposed by the latter. It may imitate only a part of the subject, and the *consequent* proposing a new melody, becomes, in its turn, the *antecedent*.

No. 2.

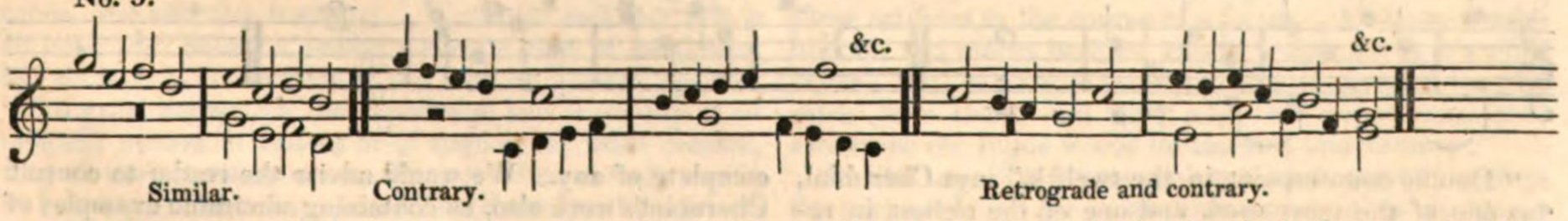


Imitation may take place in several ways. It is called *regular* or *constrained* when the nature of the intervals proposed by the *antecedent* is strictly observed in the response of the *consequent*. This of course happens when the *consequent* imitates the *antecedent* in the unison or the octave. Imitation in the fourth or the fifth is the next nearest to exact correspondence of intervals.

Imitation is called *free* or *irregular* when this exact correspondence is not observed.

Imitation is by similar motion, by contrary motion, by similar retrograde motion, by contrary retrograde motion.

No. 3.

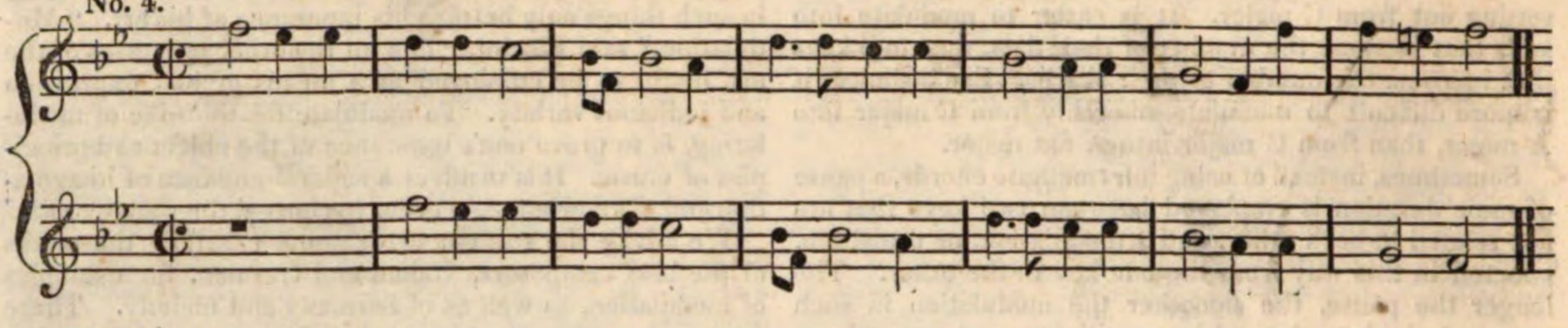


The other kinds of imitation are by *augmentation*, by *diminution*, by *countertime; interrupted, convertible, periodical, canonical*, &c.

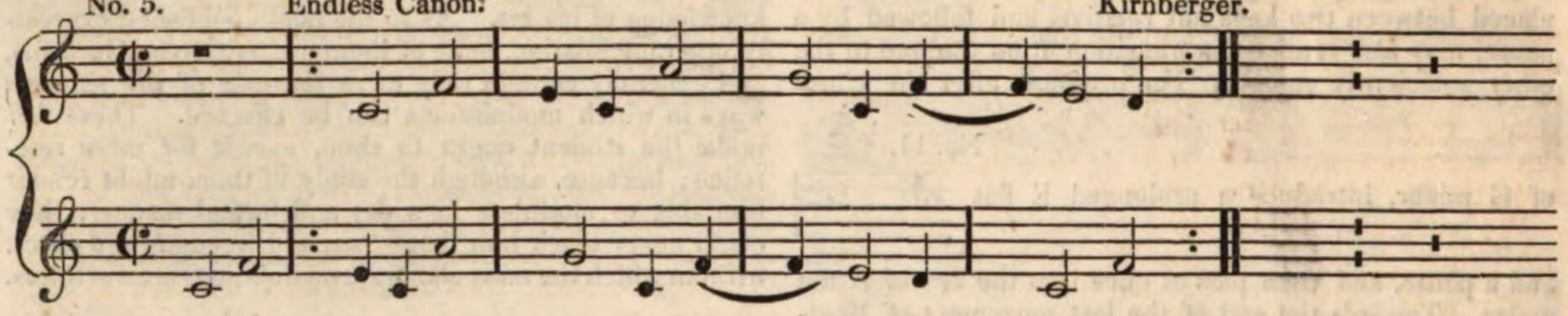
Canonical imitation is that in which the consequent answers to the antecedent, note for note, from the beginning to the end. An imitation of this kind is what is called a

Music. canon, and may be treated in two ways. It may end with a *coda*, or complete close; or it may be made what is termed an *endless* or *circular* canon, when it is so constructed that we can return from the end of the imitation to the beginning as often as we please, without stopping. Another kind of *circular canon* is one which modulates through all the twelve keys. Music.

No. 4.



No. 5. Endless Canon: Kirnberger.



A canon written upon one stave, with particular signs to indicate how and when the different parts follow each other, is called a *close canon.* Latin enigmatical mottos were often applied to these close canons, to direct the performer mysteriously. Padre Martini has given a list of fifty-six of these mottos. When the canon is written fully out in score, or partition, it is called an *open canon.*

Double counterpoint.

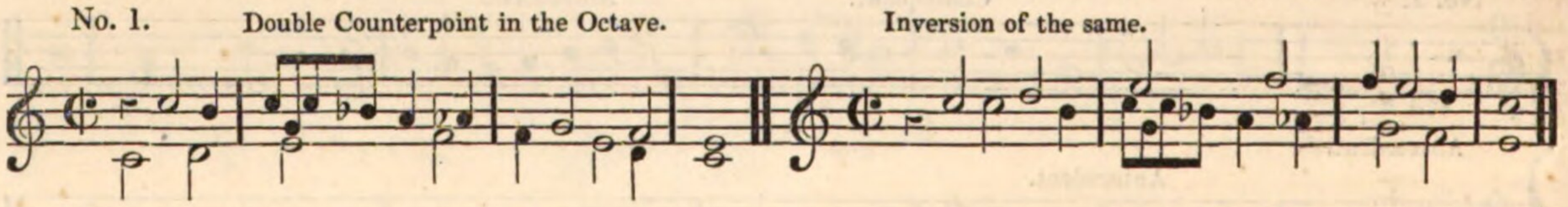
The artifice of this kind of composition consists in combining the Parts in such a manner that they may, without inconvenience, be transposed from *acute* to *grave* if they are placed above the theme, and from *grave* to *acute* if they are placed below it, while the theme suffers no change in its melody, whether it exist in one of the extreme Parts, or in one of the intermediate.

These inversions may take place in seven ways, so that there are seven species of double counterpoint. In the *ninth* or *second;* in the *tenth* or *third;* in the *eleventh* or *fourth;* in the *twelfth* or *fifth;* in the *thirteenth* or *sixth;* in the *fourteenth* or *seventh;* and in the *fifteenth* or *octave.* Those most commonly used are in the *tenth* or *third;* in the *twelfth* or *fifth;* and in the *fifteenth* or *octave.*

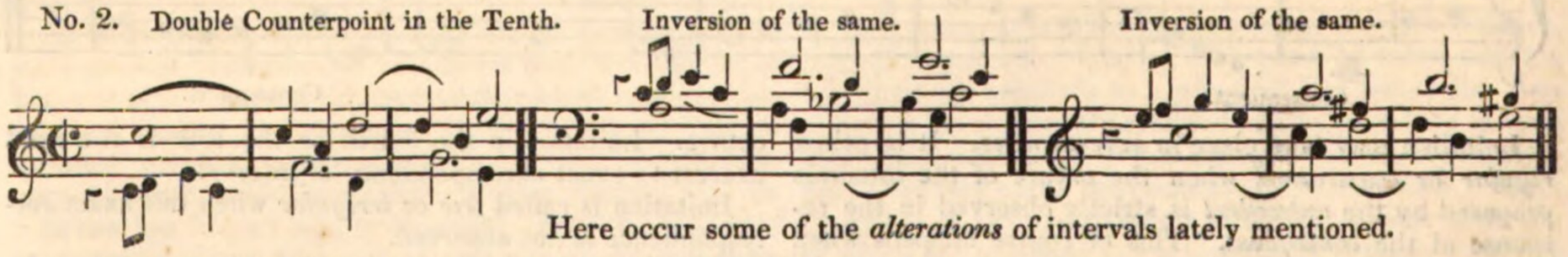
In double counterpoint the Parts ought to be, as much as possible, distinguished from each other by the different lengths of their notes. The Part which forms the counterpoint ought to begin after the theme. The Parts must not be allowed to cross one another without some cogent reason. In all double counterpoints, except that in the octave, it is not only permitted, but it is necessary, to alter intervals when inverting the Parts, especially when the modulations require this.

From what has already been said regarding the inversions of intervals, the following very short examples of double counterpoints will be more easily understood. But, for full explanations, we must refer to Marpurg and others; and, above all, to the works of the great masters.

No. 1. Double Counterpoint in the Octave. Inversion of the same.

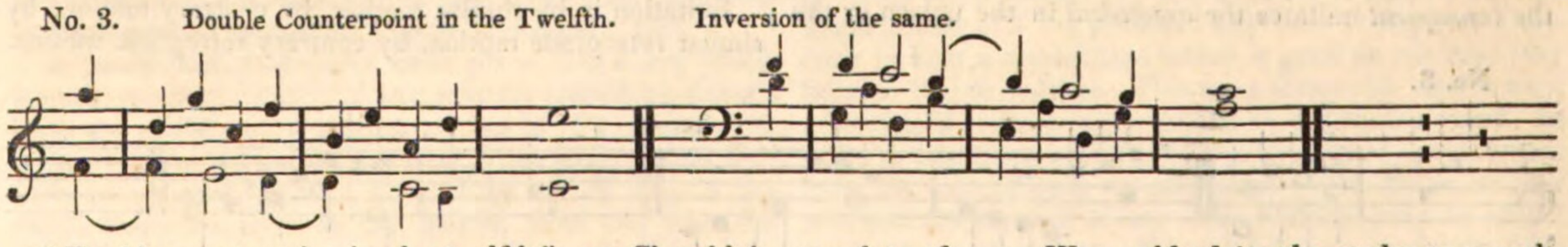


No. 2. Double Counterpoint in the Tenth. Inversion of the same. Inversion of the same.



Here occur some of the *alterations* of intervals lately mentioned.

No. 3. Double Counterpoint in the Twelfth. Inversion of the same.

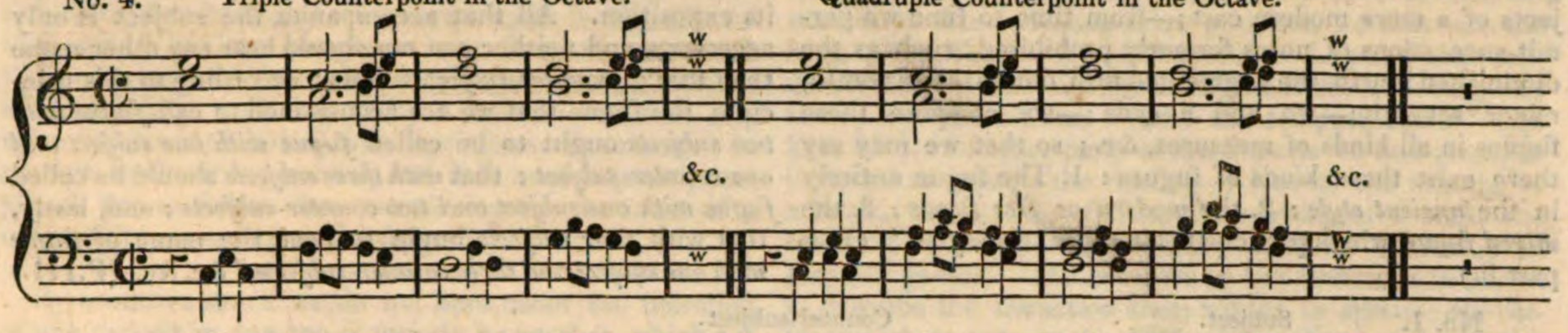


"Double counterpoint in the twelfth," says Cherubini, "is one of the most used, and one of the richest in resources." See his "Cours de Contrepoint et de Fugue," published in 1835. In this work he *specially* recommends Marpurg's Treatise on Fugue and Counterpoint, as the most complete of any. We would advise the reader to consult Cherubini's work also, as containing admirable examples of his own composition. Reicha and Cherubini seem to be at variance as to the nature of Marpurg's work. Reicha says, "il ne parle, pour ainsi dire, que des imitations et des canons."

Music. In the symphonies, quartetts, &c. of Haydn and Mozart, instances are frequent of the freest and boldest melodies being used in counterpoint with the best effect; but it is only the highest genius and most consummate skill that can do this.

There are also triple and quadruple counterpoints, susceptible of being inverted in various ways. Of these the best and most usual are in the octave, the tenth, or the twelfth. Music.

No. 4. Triple Counterpoint in the Octave. Quadruple Counterpoint in the Octave.



In these triple and quadruple counterpoints, where the *subjects* are merely doubled in thirds, there is a dryness and want of variety which had better be avoided by writing, in a free style, accessory accompaniments to the counterpoint. Our limits do not permit us to enter farther into this extensive subject. We refer to Marpurg, and Reicha, and Cherubini, for full explanations.

We must add the following passage from Cherubini: "All these examples give rise to an important remark, which is, that in spite of the denominations of *triple* and *quadruple* counterpoint, in the *tenth* or in the *twelfth*, there is no veritable *triple* or *quadruple* counterpoint, but that in the *octave*."

Fugue. The fugue is a very complicated piece of music when it is carried to its highest pitch of artifice. It comprehends all sorts of imitations, canonical contrivances, and double counterpoints. Studied with proper views and within proper limits, so as not to interfere with the supremacy of melody and with the genius of a true composer, the fugue is extremely useful as an exercise of the student's ingenuity, and as tending to show him all the resources of artificial harmonic combination. To those who have *learned* to *understand* the artificial mechanism of fugues, and who can enjoy them on that ground, they are often very admirable things, though composers of great genius might have been better employed than in constructing them. Homer, Milton, or Shakspeare, would not have done justice to themselves, had they spent their time in writing difficult poetical puzzles, such as anagrams, acrostics, single, double, and triple poems in the shapes of crosses and triangles, or in which every word began with the same letter, as in the famous *Pugna Porcorum*, beginning "Plaudite porcelli porcorum pigra propago Progreditur," and so on for five closely printed pages. All such poetry is beyond the verge of the enchanted circle of poetical inspiration. So of all calculated artifices in music. If musical *imitations*, or *canons* of any sort, suggest themselves fluently and gracefully to a man acquainted with all the elements of the art, it is well; otherwise not; for mere dry labour ought to have no place in music. Since such artificial harmonic combinations can give pleasure to the initiated only, who have gone through a long training, there seems to be no reason why the laboured contrivances of imitation and fugue should have any *preference* over the simplicity of beautiful and expressive melody, and its adjunct, appropriate and effective harmony. We know well that this is all heterodox doctrine among a certain class of musicians, but do not the less adhere to our long-established opinion. With great respect for the knowledge and ingenuity of all eminent writers of canons or of fugues, we must remark, that all these artifices arose at a time when melody was in its infancy, and had not acquired, like Hercules, the power to strangle the serpents that besieged its cradle. Among the greatest fugue writers are certainly to be reckoned G. P. Colonna, Handel, the Scarlattis, John Sebastian Bach, and his son Emanuel; and more recently Haydn, Mozart, A. Reicha, and Cherubini. Beethoven did not attempt much in this style, and what he attempted in it is not to be classed amongst his best productions. It is no wonder if a man of his towering genius and impetuous character was early disgusted by the arbitrary rules and restrictions imposed upon him by some of his unimaginative teachers, in such laboured music.

Cherubini says (we translate from the French), "The fugue, in spite of the ancient origin of the word, is, then, a creation of modern times, which was not practised in church-music until contrapuntists had freed themselves from the self-imposed obligation of working upon plain chant.....There are two kinds of fugue, from which a third kind emanates, and from this arise all the others. The two principal are, the *fugue of the key*, and the *real fugue*; the other is the *fugue of imitation*.[1] All the others, children of caprice, are *irregular fugues of imitation*, or *pieces in fugue style*. The indispensable conditions of the fugue are the *subject*, the *response* or *answer*, the *counter-subject*, and the *stretto*. To these conditions may be added the *pedal*, which is almost always employed in a fugue somewhat developed.....All the artifices which can be introduced into a fugue depend on the knowledge, the skill, and the choice of the composer, and at the same time on the nature of the *subject* and of the *counterpoint*, either or both of which may be more or less susceptible of yielding to these artifices. These artifices consist, in brief, 1. Of the employment of imitations, in detaching, to form them, a portion either of the *subject* or of the *counter-subject*; 2. in the transposition of the *subject* into different keys, and in the advantage which may be derived in this respect from double counterpoints; 3. in the inversion of the *subject* by contrary motion; 4. in a new *subject* which may be introduced, and which can be combined with the first *subject* and the first *counter-subject*; 5. in the manner of introducing the *stretto* in several ways, by drawing closer and closer, each time, the *answer* to the *subject*; 6. in the means that may be employed to make the *subject* and its inversion by contrary motion be heard simultaneously; 7. in the manner of combining the *subject*, the *counter-subject*, and the *stretto* upon the *pedal*; and in the address and the taste employed in enchaining together and introducing these artifices in the course of a fugue. All these combinations, and others besides, may be employed in a *studied fugue*; but, in a fugue for the public, a selection must be made from them, and they must not be all employed, otherwise the fugue would be too long and tiresome."

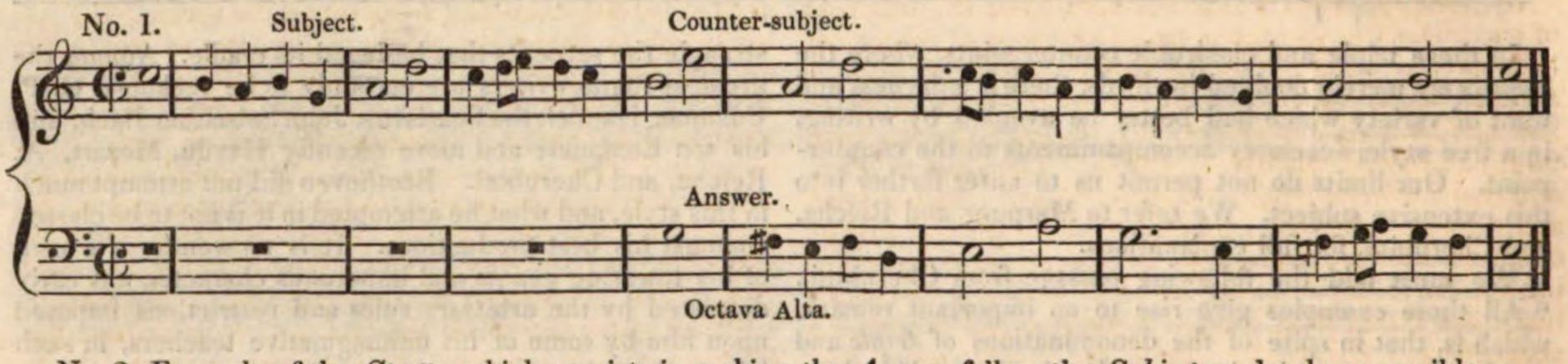
Reicha says, "it is essential to remark, that in our days the ancient fugue (or in the rigorous style) is no longer

[1] Reicha says, "Since fugues of the key are no longer composed, and as simple canons are not called fugues, the terms *fugue of the key*, *real fugue*, and *fugue of imitation*, are not really necessary, and only serve to confuse our treatises." (P. 56, 2d part.)

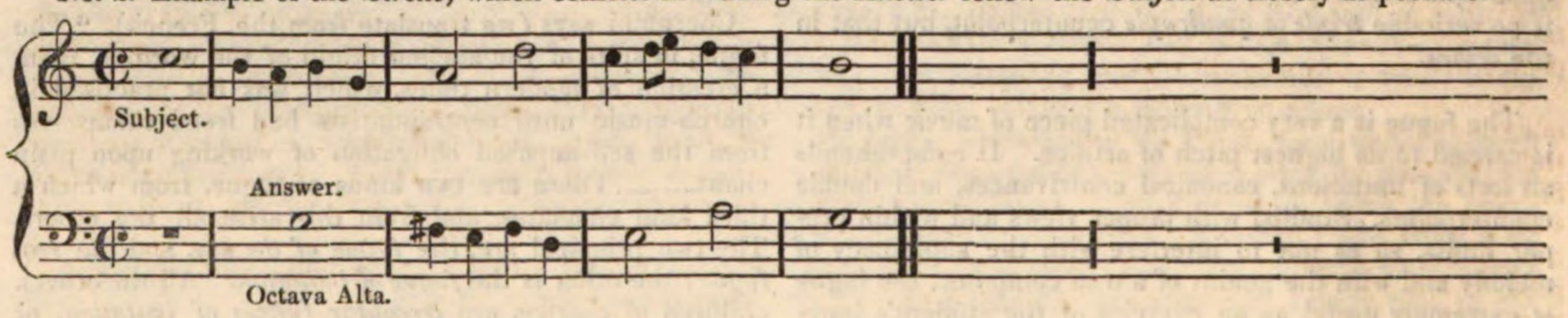
Music. composed quite under the same restrictions as in the time of Palestrina. At present we modulate in it a little more boldly, and employ more of dissonant chords. We sometimes introduce little chromatic phrases, and employ a greater variety in the values of the notes. We choose subjects of a more modern cast;—from time to time we permit successions of notes formerly prohibited, such as the diminished fourth, the augmented fifth, diminished seventh, minor seventh;—we add a coda;—we compose these fugues in all kinds of measures, &c.; so that we may say there exist three kinds of fugues: 1. The fugue entirely in the *ancient style;* 2. the *modern* or *free fugue;* 3. the *mixed fugue*, which participates in these two styles." (P. 4, part ii.)

Cherubini remarks, that "although the denomination of *fugue with two, with three, and with four subjects* is generally adopted, this denomination is, in my opinion, improper. I think so, because a fugue cannot, and should not, have more than one single principal subject, to serve for its exposition. All that accompanies the subject is only accessory, and neither can nor should bear any other name than that of *counter-subject.* Thus, according to this principle, the fugue that we are accustomed to call *fugue with two subjects* ought to be called *fugue with one subject and one counter-subject;* that *with three subjects* should be called *fugue with one subject and two counter-subjects;* and, lastly, that with *four subjects* ought to bear the name of *fugue with one subject and three counter-subjects,*" &c. &c. (P.111.) Music.

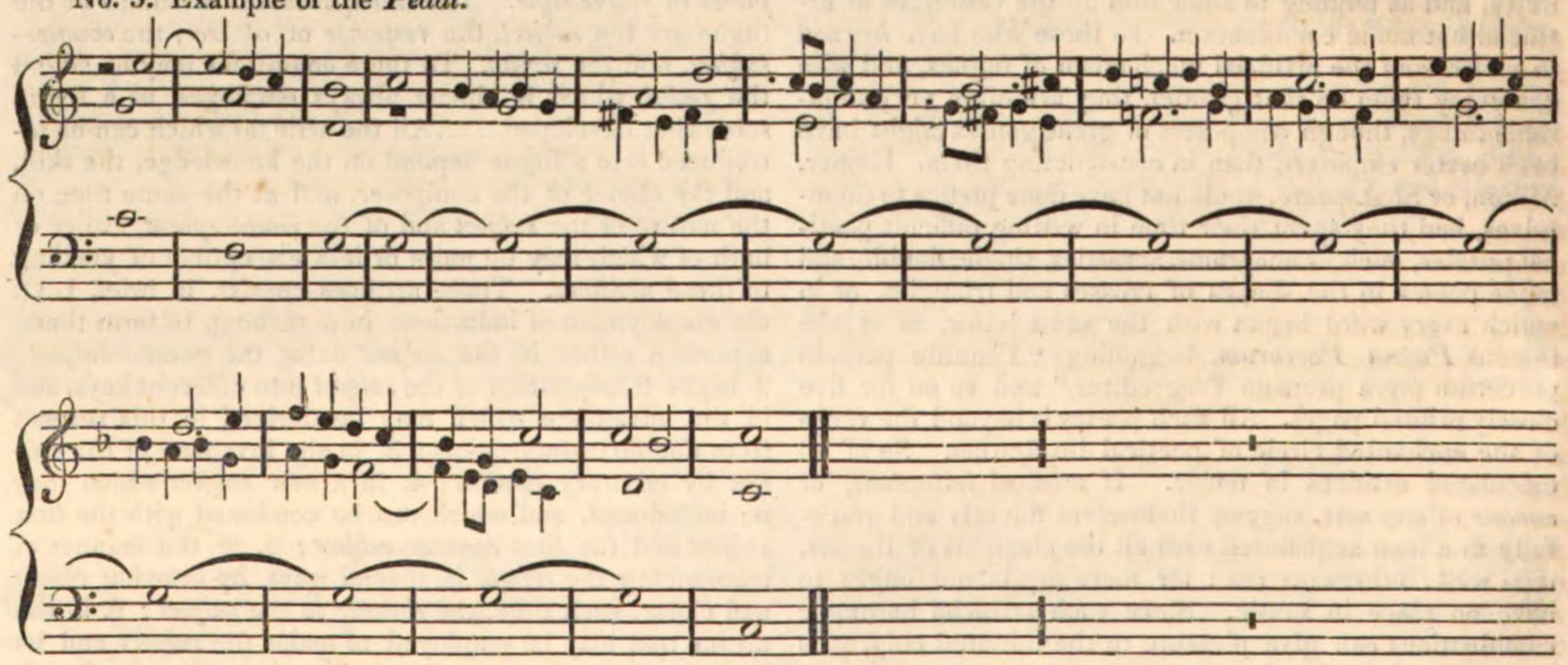
No. 1.



No. 2. Example of the *Stretto,* which consists in making the *Answer* follow the *Subject* as closely as possible.



No. 3. Example of the *Pedal.*



The *pedal* is a prolonged sound, sustained for several measures. It may be placed in the upper Part, or in a middle Part, and may occur on the key-note or the dominant; but in general it is best to place it in the lowest Part, and upon the dominant of the key.

For examples of vocal fugues, we refer the reader to Padre Martini's *Saggio di Contrappunto;* Paolucci's *Arte pratica di Contrappunto;* Choron's large work on composition, and his collection of musical classics. Clementi's collection, entitled Practical Harmony, contains a great variety of examples of instrumental fugues by different composers. Among the best of these are the fugues by Handel and the two Scarlattis, in the second volume. All Handel's fugues are excellent studies, having more melody, force, and freedom, than most others of that period. Among what are called free fugues, we would point out two beautiful specimens in Mozart's overture to the *Magic Flute*, and in the last movement of his first violin quartett in G.

Cherubini gives an advice which the student will do well to follow. He says, "we will add here, that in all the kinds of counterpoint of which we are to treat, as well as in the fugue, the scholar ought to write for voices, and not for instruments. He ought to write conformably to the natural compass of the different kinds of voices. By this practice he will have the advantage of learning to

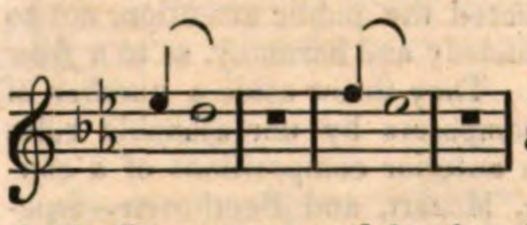
Music. produce effects by voices only,—a difficult study, and one perhaps too much neglected,—and he will find himself, afterwards, much more at his ease when he writes for instruments, and consequently is no longer obliged to confine himself within the limits of voices." Speaking of modulation (after having given general rules for it), Cherubini says, "Modern composers have freed themselves in their compositions from this simple and rational method of modulating, replacing it by a manner too free, and often incoherent; but if their deviations are tolerated in modern works, it is essential, and it is even expressly enjoined, not to follow these wanderings in the case of a composition so severe as the fugue."

Imitative music. By imitative music we do not here mean the imitation of one melody or passage of melody by another, which has been already treated of in the section connected with canon and fugue; but the employment of music, more or less appropriately and successfully, to imitate certain natural phenomena, audible or visible. The great mystery of music lies in its power of suggesting and exciting ideas and feelings in persons endowed with a sufficient degree of sensibility and imagination. In this respect it resembles poetry, for poetry is a *dead* art to all who have not sensibility and imagination enough to receive and expand its suggestions. We speak of the higher poetry; not of that which attempts in vain to be minutely descriptive or imitative, and which, by so doing, loses the nobler essence of poetry, without attaining the object proposed.

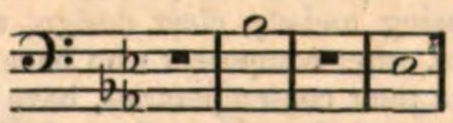
There are many musical compositions that do not aim at imitation or expression of any determinate kind. Such are the great majority of pieces of instrumental music. Some fanciful persons have gone so far as to imagine a story told, or a scene described, by a quartett or a symphony, although the composer gave no indication of any such purpose, and would have transgressed the true imitative limits of his art by doing so.

One of these fanciful persons, Momigny, in his *Cours Complet d'Harmonie et de Composition*, has ventured to give what he calls "a picturesque and poetical analysis" of the introductory movement and succeeding allegro of Haydn's eighth Symphony in E♭, and to add words here and there, to show what the music is intended to express. Momigny has also adapted words (see his third volume) to the first movement of Mozart's second Violin Quartett in D minor, and tells us that "he thinks he has discovered that the feelings expressed by the composer were those of a loving female on the point of being abandoned by the hero whom she adores," and that this luckless woman was Dido! All this, however, is mere imagination, and every one is at liberty to exercise his own fancy in such cases. In such a composition as Beethoven's famous Pastoral Symphony, it would certainly be impossible for any person to divine, merely from hearing it played, what was meant to be expressed or imitated by the different movements of that remarkable work. Unless he were previously told that such a movement was meant to express the sensations excited by visiting a country scene; such another, those felt beside a river; another movement meant to imitate a storm, and so on; certainly his imagination might lead him to guess very wide of Beethoven's intentions. The only things that he could have no doubt of, if accustomed to such rural sounds, would be the notes of the quail and the cuckoo, introduced in the river scene. As to the nightingale, he could make nothing of it, because the notes that Beethoven uses do not express the subtle song of that bird, any more than Handel's notes do in his song "Sweet Bird," in the *Penseroso*. In the oratorios and operas of eminent composers are to be found many instances of attempted imitations, most of which had better have been omitted. To attempt to imitate, by music, a hail or a snow storm, the leaping or creeping of animals, the falling of walls, and so on, is to mistake the powers of the art. A particular style of music may sometimes be effectively employed to enforce the ideas conveyed by descriptive words. In Haydn's *Creation*, and *Seasons*, we have several instances of this. Among other passages, we may cite the song in the *Seasons* (pp. 396 to 408 of Leipsic Partition), describing the traveller wandering bewildered among the snow; and the chorus, "Oh! the tempest comes" (pp. 203, 230). In other parts of the *Seasons* we find passages intended to express the rustling of leaves, the running of a brook, the buzzing of flies, the crowing of a cock, the croaking of frogs, &c. but most of them unworthy of Haydn's genius. The overture to the *Seasons* is intended to describe the transition from winter to spring; the introduction to summer (p. 138), "the dawn of day;" the introduction to autumn (p. 252), "the husbandman's satisfaction in contemplating the abundant harvest;" the introduction to winter, "descriptive of thick fogs." All these are phenomena not susceptible of musical imitation; and the consequence is, that the fancy of the hearer might lead him to associate the pseudo-imitations with ideas totally different from those which Haydn intended to suggest. The philosopher D'Alembert says, "Si j'avois à exprimer musicalement le feu, qui dans la séparation des *élémens* prend sa place au plus haut lieu, pourquoi ne le pourrois-je pas jusqu'à un certain point par une suite de sons qui iroient en s'élévant avec rapidité?" and, a little after, "Si je voulois peindre le lever du soleil, pourquoi ne le pourrois-je pas par une musique dont le son auroit un progrès assez lent, mais iroit tout à la fois en s'élévant et en augmentant d'éclat, précisément comme le soleil quand il se leve?" Haydn, in the representation of chaos in his *Creation*, and in the introduction to the recitative "In splendour bright," in the same oratorio, seems to have had D'Alembert's ideas in view.

Many striking instances of indirect musical imitation may be found in the operas of Gluck. One of them occurs in his opera of *Iphigenia*, in the scene where Agamemnon deplores his daughter's lot in these words: "J'entends retentir dans mon sein le cri plaintif de la nature," &c. This "plaintive cry of nature" is expressed by the wailing notes of the oboe heard at intervals,



&c. while the "oracles of destiny" are expressed by the gloomy and obstinate responses of the bassoon,



&c.

This remarkable passage is given, with a criticism upon it and some others from Gluck, in the first volume of Forkel's *Musikalisch-Kritische Bibliothek*.

Musical invention. The famous painter Leonardo da Vinci, in his Treatise on Painting (c. xvi.), thus expresses himself regarding the aids to pictorial invention that may be derived from the contemplation of confused objects: "Se riguarderai in alcuni muri imbrattati, o pietre di varij mischj, potrai quivi vedere l'inventione e similitudine di diversi paesi, diverse battaglie, atti pronti di figure, strane arie di volti, et habiti, e infinite altre cose; perchè nelle cose confuse l'ingegno si desta a nuove inventioni." A painter of such genius as Leonardo da Vinci may have his imaginative faculties thrown into action by "a blotched wall, or by stones of various colours," or by other objects that would

Music. produce no impression upon an ordinary man. So it is with the musical composer endowed with genius. To persons who feel and understand both poetry and music, poetry is well calculated to suggest musical ideas. We should think little of the musical genius of a man who could peruse the *Allegro*, or *Penseroso*, or *Comus* of Milton, and feel their beauties, without having his musical imagination strongly excited. To the musician of a poetical temperament (such as Beethoven), the glories of sunrise or sunset—the various gentler lights and shadows of morning or of evening—the more solemn and mysterious lights and shadows of the moonlight landscape—the wildness and vastness of mountainous scenery under all the aspects of "skyey influences"—the calm or the agitated sea—the dreary sounds of the tempest—the thrilling sublimity of the thunder-storm—will suggest musical ideas by some strange alchemy of mind yet unknown to musical theorists.

Musical invention, like poetical or pictorial, is really no more than the art of combining, in new and remarkable forms, certain elements presented to us by nature or by art. In music, vocal and instrumental, sounds are those elements; in poetry, sounds and language, signs that fluctuate in their nature and uses, and in their indications of innumerable external objects and endless shades of human feelings and passions; in painting, forms of infinite variety, and colours contrasted or combined in all the possible diversities of light and shadow. As to musical invention, or originality in melody and harmony, those who have the most extensive acquaintance with the musical compositions of the last two centuries must perceive that there is very little originality to be found in the compositions of our day. Melodic ideas and phrases, except of the most artificial kind, were nearly exhausted before the commencement of the nineteenth century. The works of Galuppi, Piccini, Sacchini, Paesiello, Sarti, and many other Italians, are now hardly known to the public; and yet from them the more modern melodists have drawn most of their best ideas of melody. The artificial combinations of harmony, and successions of modulations, had been carried to a great extent by some of the Italian composers—the Scarlattis and others—and by Handel and the Bachs and Bendas, and others among the Germans—before Haydn, Mozart, and Beethoven directed the public attention, not so much to a new style of melody and harmony, as to a *freer* style of both combined. They threw aside a number of fetters imposed upon composers by unreasonable rules drawn by theorists from anterior compositions of a conventional kind. Haydn, Mozart, and Beethoven—especially the two former—seem to have carried artificial music nearly as far as possible without rendering it void of pleasing melody, clear design, and intelligible harmony. Most other composers who have come after them, or who were their contemporaries, have done little more than caricature their styles. Some of the more fashionable composers who have deigned to keep any thing like melody in view, have had recourse to the older and forgotten masters, and pillaged them without mercy. But, after all, it must be confessed that no limits can be assigned to change and innovation in an art so vague and arbitrary in its general signification as music, and so dependent upon the training given to the public ear. That beauty and deformity are mere mental affections, and not existences separate from the sentient being who feels them and judges of them, is proved every day by the diversity of human opinions regarding productions of the fine arts. It is vain and absurd to argue upon these matters. The old proverb that says "there is no disputing of tastes," Music. holds not only in things affecting the nerves of the tongue and palate, but also in things affecting the eye and the ear. It is not unworthy of remark, that the word "taste" has been so transferred from its original signification as to be applied, by common consent, to the senses of sight and hearing, and even to what may be supposed to be more intimately intellectual judgments regarding the merits of poetry and oratory. Where are we to find a perfect theory of poetry and oratory? although these arts stand at the head of all human arts. Choron writes as follows regarding musical invention: "In music, and in the arts in general, we call *idea* that which in a more exact language we call thought. However that may be, the musical *thought* or *idea* is usually a passage of melody which presents itself to the mind of the composer with all its suitable accessories. From this we perceive that there are many kinds of different ideas, according to the sort of effects, whether simple or compound, which they employ. We ought also to distinguish ideas into principal ideas and secondary ideas. The first are suited to form the basis or foundation of a composition; the others are applied to the development of the principal ideas. It requires art and experience to discern whether an idea belongs to the one or to the other of these classes; and also to perceive whether an idea is suited to the free or to the severe style of composition; and to be able to develop it according to the rules applicable to each of these styles. The art, or, more properly, the faculty of finding ideas, is called invention. This term sufficiently indicates that we look upon invention as almost entirely a gift of nature. No rules whatever can be laid down upon this subject. We can only offer some observations which may be useful. We distinguish two kinds of invention; invention properly so called, and invention by imitation. What we have just said applies particularly to the former kind; that kind of invention which creates new and original productions that do not resemble preceding ones, and that serve as models for succeeding productions. It is the most distinctive characteristic of genius. It is found in the details as well as in the general structure; in the manner as well as in the matter. An artist often shows as much genius in treating, in his own way, a common idea, as he could by producing new ideas. Invention by imitation consists in approximating, in peculiarities of style and manner, to some production already known.[1] Although this seems more easy than the other, it has its dangers and difficulties. The chief objection to it is the danger we incur of falling into plagiarism; a danger which cannot be avoided if we have not enough of imagination, taste, and skill, to enrich by accessories of our own, or to disguise dexterously, the materials which we endeavour to appropriate to ourselves. On the other hand, a happy imitation may be as good as a real invention. The talent of invention is developed by a continual application of mind to the object of invention, by the study of original works, and by directing the attention to seek in all things for the relations that they may have to the art which we cultivate. A thousand things that appear indifferent or useless to an inattentive man, become very significant to him who refers every thing to a principal object. We are often astonished that artists should have been so happy in their invention, and ascribe this to superior genius. We should be much more astonished if we knew to what circumstances they owe these advantages. The greater part of their talent consists in neglecting nothing, and in perceiving in what surrounds them every thing that can have connection with

[1] See Clementi's admirable preludes in imitation of the different styles of Haydn, Mozart, Dussek, &c.; and J. B. Cramer's *parody* of one of Dussek's Sonatas for the piano-forte; and Mozart's compositions in imitation of Handel's style.

Music. their art. If we are attentive in collecting every thing that presents itself, and take care to treasure up the ideas which occur in favourable moments, we shall soon form a rich collection of materials from which we can draw when occasion requires. Finally, we must never torture ourselves to find ideas; and must especially shun that mania of originality which induces us to reject easy and natural ideas, and to run after fantastical and perplexed ones. One may often present novelty under a guise almost common. On the contrary, as Boileau says,

> Il est certains esprits dont la fougue insensée
> Toujours loin du droit sens va chercher leur pensée,
> Ils croiroient s'abaisser dans leurs vers monstrueux
> S'ils pensoient ce qu'un autre a pu penser comme eux.

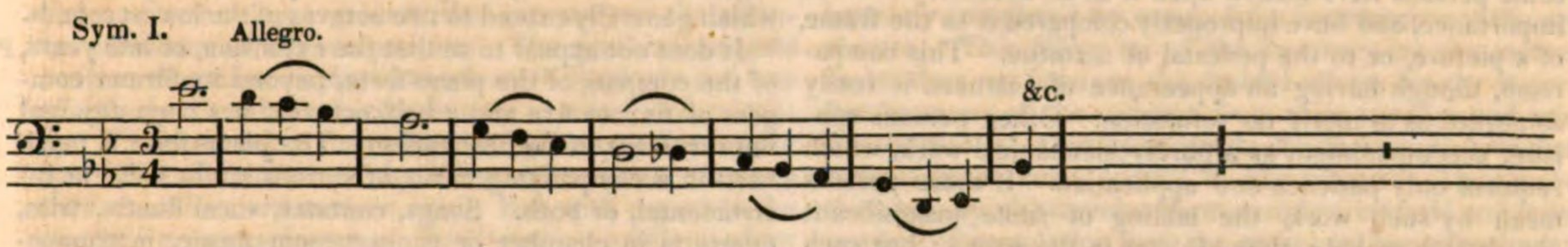
And all this is often mere lost labour; for an idea which at first seems new, on account of the manner in which it is presented, is frequently reduced to nothing when it is brought back to its true expression.

Development of musical ideas, and conduct of a composition.

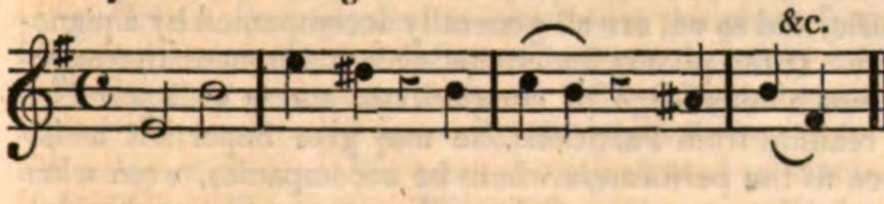
"If the gift of invention is invaluable, we may say that the art of conducting and developing ideas is not less important. We might cite many authors who, though not remarkable for variety or originality, have yet acquired a great reputation by the talent which they have shown in the development of their ideas. Among such authors are Sacchini and Anfossi; and in the works of authors very rich in invention might be pointed out pieces that have become highly celebrated, and of which the sole merit lies in the taste and the art shown in the development of the ideas." Most of Haydn's compositions are unrivalled models of skill and judgment in the development of musical ideas, and the conduct of the melody, harmony, and modulation. The study of double counterpoint, especially of that in the octave, is of essential importance to the attainment of skill in developing musical ideas. A knowledge of double counterpoint offers numerous resources to the composer of a symphony, an overture, an instrumental quartett, &c.; and, indeed, without such knowledge, it is impossible to make the most of one's musical ideas. This kind of knowledge is far remote from the dry and cumbrous learning of most of the older contrapuntists; learning which generally served no better purpose than to enable them with great labour to construct music *for the eye*, and not for *the ear*. To show the advantages that a composer of symphonies may derive from a knowledge of double counterpoint, we have only to refer to Haydn, Mozart, and Beethoven. Among Haydn's symphonies, the following movements occur to us at this moment as containing examples of what we have just been discussing. We refer the reader to the Partitions.

Music.

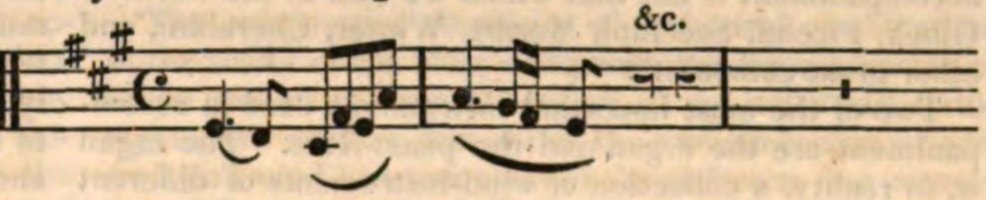
Sym. I. Allegro. &c.



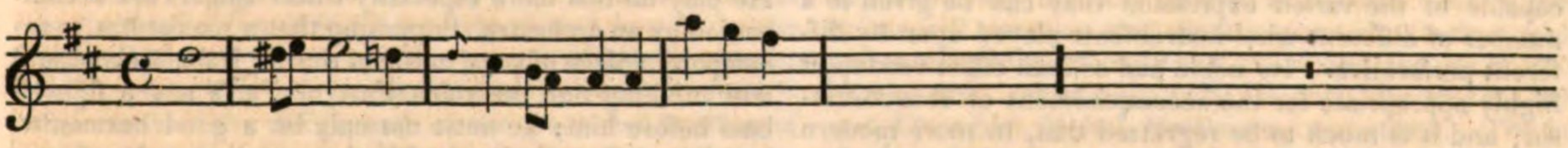
Sym. X. Allegro. &c.



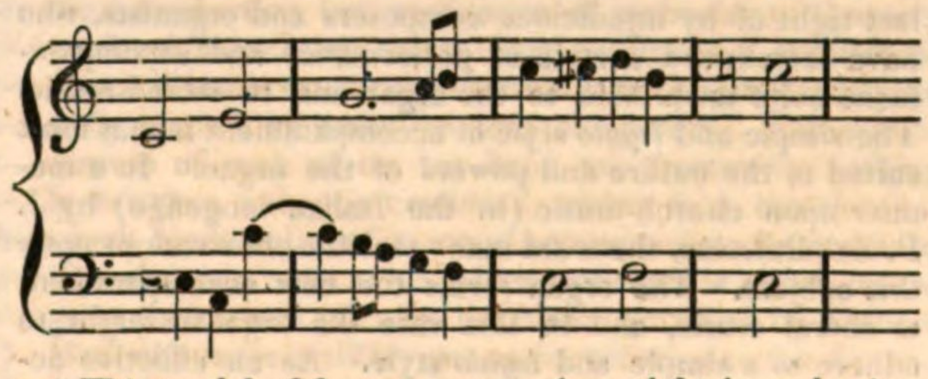
Sym. XVI. Allegro. &c.



Sym. XVIII. Presto.



No writer on composition has treated so fully as Reicha of the uses of double counterpoint in the development of musical ideas. (See his *Traité de Haute Composition Musicale*, a large and expensive work, of 596 folio pages.) It is to be regretted that Reicha, in his two large works on composition, does not give examples from the works of the best composers. He does not even give direct references to such passages in the works of these composers as might illustrate his rules and observations. A man so versed as he was in music of all kinds could have done this easily; especially as his treatises were of great extent, and could have admitted of many classical examples, instead of those which he gives composed by himself or by his pupils. He says (p. 140 of first volume), "Now-a-days, it is required that the employment of any counterpoint should be effective. If a composer has not genius enough to accomplish this, he will do well not to make use of counterpoint... In all the treatises where counterpoint is spoken of, there is a defect, inasmuch as they neglect to show, in a satisfactory manner, the true resources offered by counterpoint. This is the cause that the public has never had a just idea of invertible harmony, and of its utility. Here is an example of a double counterpoint in the octave.



"This model of four measures gives eight in reckoning its inversion. This is nearly all that is generally known. But what is to be done with eight measures, it is asked, if there are no more? These eight measures may serve as follows.

"1. To form a canon for two unequal voices—(*i. e.* voices of different pitch and compass).

"2. To form an entire double fugue for two, three, or four Parts.

"And, which is more important in our days, these eight measures can be employed, 3*dly*, in the course (chiefly in the second section) of a movement in a symphony, &c. where a very advantageous use of them may be made; as, for example, fragment of a movement in a

Music. symphony for a grand orchestra, formed entirely from the preceding counterpoint."[1]

Reicha then proceeds to show, by a Partition on the five following pages, the use and development of this counterpoint in the fragment above alluded to. We must refer to the passage in the original work.

Accompaniment. This term sometimes signifies the harmonic support given to a melody or to a principal voice by one or more instruments, and sometimes means that knowledge of chords which is required in playing from a figured bass, or from a Partition. Since a voice or an instrument, or several voices or several instruments, may be accompanied by one or more instruments, the variety of combinations of this kind are almost endless. Melody, which forms the most expressive part of musical language, and regulates the march of composition by different rhythms, usually occupies either the highest or the lowest Part of a piece of music, in order to become more conspicuous. But sometimes, to produce a particular effect, the melody is placed in a middle Part. When this happens, or when it occupies the lowest Part, the accompaniment must be disposed accordingly, and constructed in such a manner as to produce the best possible effect in union with the melody. Since accompaniment is always subordinate to melody, some persons have looked upon it as an accessory of little importance, and have improperly compared it to the frame of a picture, or to the pedestal of a statue. This comparison, though having an appearance of justness, is really so absurd as to merit no refutation. Other persons consider accompaniment as a purely mechanical work, which requires only patience and application. If those persons mean by such work, the adding of some insignificant chords to a melody, they are not in the wrong; but such accompaniment is not that which we find in the works of Gluck, Piccini, Sacchini, Mozart, Winter, Cherubini, and other great composers.

Organ and piano-forte. Two of the most important instruments used in accompaniment are the organ and the piano-forte. The organ is, in reality, a collection of wind-instruments of different kinds, forming in itself a species of orchestra, but not capable of the varied expression that can be given to a number of different wind-instruments played upon by different performers. Its noble and solemn effect renders it highly appropriate for the accompaniment of church-music; and it is much to be regretted that, in more modern times, its true character and powers have been too often lost sight of by injudicious composers and organists, who have introduced a style of performance and accompaniment quite unsuitable to the organ and to sacred music. The simple and *legato* style of accompaniment is that most suited to the nature and powers of the organ. In a memoir upon church-music (in the Italian language) by J. P. Schulthesius, there are many sensible observations upon this subject. The organ forms the best accompaniment to choral music, and in this case the organist ought to adhere to a simple and *legato* style. As an effective accompaniment to other sacred compositions, such as masses, &c., the organ is too much neglected by modern composers. The organ accompaniment ought always to be written in notes as the composer intends it to be performed, and never left to be guessed at by the organist through the puzzling and uncertain signs of a mere figured bass. We refer to what we have said on the subject of thorough-bass in the section on harmony. When the organ is used along with an orchestra, as in Haydn's and Mozart's masses, and others, it would often be better for the effect, if the organ were more employed in strengthening the bass Parts than in giving the full harmony of the chords; because, in the latter case, the peculiar effects of some of the orchestra wind-instruments would be obscured or overpowered. Fine effects may be produced by a judicious use of only certain stops of the organ, even in accompanying with an orchestra. In some modern organs, the compass of the finger-keys (reckoned upwards from the eight-foot stop, or an open pipe eight feet long) is from the lowest C on the piano-forte up to F in alt, with all the intermediate semitones. In many other organs, the compass is not so extensive. There are, besides, stops of sixteen, and sometimes (in the largest organs) of thirty-two feet pipes, for the pedals. It must be observed, that in different organs the stops vary much in kind as well as in number, and that all the stops do not extend throughout the whole finger-keys, but in most organs serve for only one half of these keys. This is not the place to enter more minutely into the structure of the organ. Most foreign organs have pedals, or foot-keys, which generally extend to two octaves of the lowest sounds.

Piano-forte. It does not appear to us that the extension, of late years, of the compass of the piano-forte, beyond its former compass of five or five and a half octaves, has been any real improvement of the instrument. The piano-forte is much used in accompanying music of various kinds, vocal or instrumental, or both. Songs, cantatas, vocal duetts, trios, quartetts in chamber or concert-room music, instrumental solos, orchestral symphonies or overtures, operatic music, and so on, are all generally accompanied by a piano-forte. If the pianist understands his instrument thoroughly, has a knowledge of composition, and is well practised in reading from Partitions, he may give important assistance to the performers whom he accompanies, even when there is a complete orchestral accompaniment besides. He may do this more especially where singers are accompanied by an orchestra. Supposing that a pianist has to accompany a piece of vocal music of the old Italian school, and with nothing but the voice Part or Parts and a figured bass before him; he must not only be a good harmonist, but also well acquainted with the peculiar style of harmony and accompaniment suitable to such compositions, and really intended by the author, although not expressed by the imperfect system of thorough-bass notation anciently employed. Among these ancient composers, who were almost all excellent harmonists, there was a method of accompaniment practised by them as appropriate, and which, from tradition and habit, was clearly understood even by means of the imperfect and conventional signs of thorough bass. But this is no longer the case; and a modern pianist who would accompany a cantata of Alessandro Scarlatti, or a duett of Clari, or a psalm of Marcello, and so on, as the composer intended, must make a particular study of the older style of accompaniment, otherwise he will fail in his attempt to accompany such compositions.

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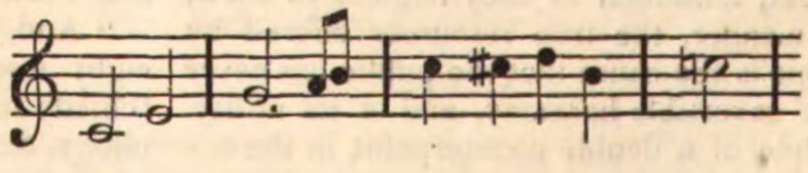
[1] "This fragment being placed in the second section of the movement, supposes that the first or the second subject of the counterpoint, or both, have been previously heard in the first section. Without this precaution, the hearer would feel it as something foreign to the movement, as out of place, which would be a fault on the composer's part. To render this counterpoint appropriate to the movement, it is enough that the four measures  form a part of the *subject* of the movement."

Music. He will make the harmony too full, or too thin, or dispose it in an unsuitable manner. As we have not room for examples of the style of accompaniment suitable to such music, we refer the reader to the edition of Marcello's Psalms, published in Paris some years ago by Mirecki, a pupil of Cherubini. It was revised by Cherubini himself. In that work the accompaniments are given as they ought to be, and may serve as models for the accompaniment of such music, and of much of the music of that period—the latter part of the seventeenth and the earlier part of the eighteenth centuries. The accompaniment of the compositions of that period for voices is generally attempted by modern pianists in mere dry chords read from the thorough bass figures and notes. Such an accompaniment is quite erroneous in so far as regards the composer's intention, because the accompaniment of these pieces *was* an *accompagnamento figurato* for three Parts, each of which Parts had its own melodic progression, and the whole three were so contrived as to sustain the voice or voices, and enforce the effect of these without overpowering them.

To accompany a Partition from which the pianist has to select, on the instant, those parts most important to the effect, while he leaves out others, or portions of others, requires great practice and knowledge, especially with regard to more modern Partitions. Formerly, the most important parts of a Partition were the two violins, viola, and violoncello, forming a quartett that represented the essential structure of the composition. The wind instruments were at that time employed much more sparingly and less effectively than they afterwards were in more modern music. There are other circumstances in the structure of the older Partitions which render it less difficult to accompany them than the more modern ones. But, with regard to the pianist's accompaniment of Partitions, especially modern ones, we may remark, that the attempt too often made by injudicious accompaniers to crowd into the piano-forte accompaniment all the orchestral effects that they see in a Partition, is worse than useless. The thing is impossible, from the nature and powers of the piano-forte, and its uniformity of *timbre*. We have already alluded to this in the section on Harmony. Where there is any particular and prominent design in the Parts of a Partition, the pianist ought to adhere to it in his accompaniment, in so far as the nature of such design and the powers of his instrument will permit. In many cases he must be content to sacrifice much of the design, and of the grace and freedom of movement, found in the Parts of the Partition, and to arrange his accompaniment in such a way as to make the most of the difficulties presented to him by the construction of the Parts. This will frequently occur to him in accompanying modern Partitions, which often contain so elaborate a construction of Parts as almost to defy any attempt to represent even a shadow of them in the piano-forte accompaniment. The best way of learning how such intricate Partitions may be suitably accompanied by the piano-forte, or how they may be arranged for the piano-forte, so as to accompany the voice Parts (for example) without any other instrument, is to study carefully the best Italian and German arrangements of the best Italian and German operas, oratorios, masses, &c. for the piano-forte, with the voice Parts; for example, Clementi's admirable arrangement of Haydn's *Creation;* the best French or German editions of the similarly arranged masses and operas of Mozart, Winter, Cherubini, Beethoven, &c. To render this study really useful, the accompanier must, at the same time, have before him, and consider attentively, the Partitions from which these arrangements were made. No abstract rules can teach the art of accompaniment. Nothing but talent, experience, and observation can do so; and therefore we would urge the student to go at once to the interesting fountain-head of good models, and not to waste time upon dry technicalities. Many pianists make a very easy matter of accompaniment, by reducing it to a series of dry chords (*accords plaqués*) or else broken chords in the vulgar form of what some musicians used to term "chopped hay." For the proper piano-forte accompaniment of modern songs, duetts, &c. the reader may consult the compositions of this kind by Haydn, Mozart, Cherubini, Beethoven, Himmel, &c. where the accompaniments are written by the composers themselves. The harp, although introduced of late years into orchestras, is not very effective in such a situation, unless when occasionally left nearly alone to accompany some vocal Part in an opera, or in concert-room music. It serves better for an accompaniment in chamber-music. The guitar, skilfully managed, forms a pleasing accompaniment to a single voice in songs of a certain character. Although the greater part of its sounds belong to the bass and tenor range, music for the guitar is written in the treble clef; so that the sounds heard are really each an octave lower than they are represented by the notation.

Before we conclude this section, we must advert to a fault not uncommon in the compositions of Germans for voices with orchestral accompaniments. Even Mozart himself has sometimes committed this fault. It occurs when the harmony for two or three voices is incomplete, and a succession of fourths, for example, is left to have the harmony completed by some of the instruments of the orchestra. This filling up of the harmony by the instruments does not produce the desired effect; for the imperfect harmony of the voices,—from their peculiar and prominent *timbre*,—is still perceived. The best modern Italian composers are more careful in this respect. They make the harmony of their voice Parts complete in itself, and independent of completion from the orchestral accompaniment.

Orchestral music. The comparative simplicity of orchestral combinations in the works of the older composers has been adverted to in the preceding section. Gluck, in the latter part of the eighteenth century, was one of the first composers who introduced wind instruments into the orchestra in a manner more effective than had till then been practised. Any musician who will take the trouble to examine Gluck's Partitions will perceive that they suggested to other composers many ideas of orchestral effect from the use of wind instruments,—ideas more fully developed by Haydn, Mozart, Cherubini, Mehul, Beethoven, and others. The invention of new instruments, the improvement of old ones, the introduction into orchestras of instruments formerly confined to military music, have produced a superabundance of materials for orchestral effect; a superabundance sadly abused by many modern composers. The consequence of such abuse has been too frequently nothing better than a chaotic confusion, arising from the simultaneous combination of so many heterogeneous instruments. The *elaborate noise* of a modern orchestra is sometimes so great as to stun all ears but those petrified by custom. Men who serve artillery get so accustomed to the din and roar of cannon that they suffer no more annoyance from such noise than other untrained persons do from the distant explosion of a spent rocket in its highest altitude. They come at last to relish the martial din that deafens a common bystander.

In the section upon voices and instruments, we have occasionally adverted to the most suitable employment of some of the latter in orchestral music. We shall here offer a few more remarks upon this subject, and upon orchestra music in general.

A complete orchestra consists of a number of stringed instruments and wind instruments, and a few instruments of percussion; the latter being generally kettle-drums. The nature and magnitude of an orchestra must be regu-

Music. lated by the locality, since a large orchestra in a small theatre or concert-room, or the converse, would be ineffective, though from different causes. The relative proportion of the instruments in an orchestra is of much importance to its effect. The orchestra of the Italian opera at Vienna is small, in order to suit the locality. It was recently as follows: one conductor, one violin *obbligato* for accompanying particular parts of the vocal music, one leader and five first violins, six second violins, four viole, four violoncellos, four double basses, two flutes, two oboes, two clarinets, two French horns, two bassoons, two trumpets, three trombones, one drum, one double drum, one piano-forte; in all forty-three instruments. This is about the same number and proportion as in the orchestras of Dresden, Francfort, and the Italian opera at Paris. The orchestra of the opera at Berlin is much larger, on account of the greater size of the house. In those smaller orchestras, the wind instruments are suited in size and tone to the fewness of the stringed instruments. The double basses, too, are small sized, and have four strings, except the principal one, which has five, to facilitate the execution of difficult passages. The orchestra of the grand opera at Paris lately consisted of twenty first violins, twenty second violins, fourteen viole, thirteen violoncellos, six three-stringed double basses, three four-stringed double basses, four harps, four flutes, four oboes, four clarinets, four bassoons, three trombones, horns, trumpets, kettle-drums, one serpent. The number of performers in the orchestras of the Scala at Milan, and San Carlo at Naples, used to be, at most, about ninety-three; but their number varies, and has of late been reduced.

Trumpets, trombones, the serpent, and kettle-drums, are too noisy to be suited to a small orchestra; and the judicious composer will, in such a case, avoid them. In writing for an orchestra, the stringed instruments form, as it were, the body of the composition, or a complete harmony in four Parts among themselves. This quartett consists of first and second violin, viola, and violoncello; the double basses being employed to enforce the violoncello Part. The number of violins, viole, and violoncellos, makes no difference in the real harmony of this quartett, because if there are twenty first violins they all play the same Part, and so of the second violins, and viole and violoncellos respectively. But, for the sake of variety, the full quartett is not always continued through a whole movement, but is sometimes interrupted by harmony in two or three Parts, and by passages in unisons or octaves. Occasionally, also, but more rarely, the stringed instruments cease altogether for a short period, to allow a passage for wind instruments alone to be heard with more effect from contrast; for instance, in the trio of Beethoven's first symphony in D major, Op. 36; in the trio of his symphony in C major, Op. 21; and in the trio of his *Sinfonia Eroica*, Op. 55; and, *passim*, in the orchestral compositions of Haydn, Mozart, Cherubini, Weber, Spohr, &c. The stringed instruments of the orchestra are often employed without being accompanied by any of the wind instruments. By the addition of wind instruments of different kinds, and in different ways, to the stringed instruments, a great variety of combinations and effects take place, which open a wide field of resources to the composer. It is important to remark, that whether the stringed instruments form a quartett, a trio, or a duett, their harmony ought to be good in itself, independently of the addition of any wind instruments. The same remark applies to the harmony of a duett, trio, or quartett, formed by a combination of wind instruments. The harmony must be good and pure independently of any filling up by the addition of stringed instruments. It is hardly necessary to say, that the uses which may be made of all these possible combinations of the wind instruments with the stringed ones, or of wind instruments with wind instruments, depend entirely for their good effect upon the skill and judgment of the composer. One of the wind instruments added to the stringed ones, may either double one of the parts of these, if its nature permit it to do so, or may have a distinctive melody given to it, and be accompanied by all, or by only one, or two, or three, of these Parts; and thus, in the latter case, form with them a quintett, or a quartett, or a trio, or a duett, for the time being. Thus, the bassoon, or the horn, for example, may double the bass Part of the stringed instrument quartett of the orchestra, or any of the other Parts, to produce a particular effect of reinforcement; or it may have a distinctive melody, and be accompanied as before mentioned. The same remark extends to the flute, the oboe, the clarinet; with this exception, that instruments of a high pitch, like these, are not properly employed to double the bass Parts of the orchestra. By this *doubling* of a Part is to be understood the addition to it of another instrumental Part, which performs the same melody in unison, or in octave higher or lower, according to the nature and compass of the added instrument. When accompanying a wind instrument of a grave pitch with two violins, the accompaniment is generally above the melody. In this case, the melody should form a good bass to the accompanying harmony; and if it does not, then the orchestral basses must be employed to supply the defect. To accompany a bass instrument which has a principal melody, with other instruments of a higher pitch, often requires much dexterity in the management of the harmony. Music.

The number of possible combinations of the different instruments in an orchestra is so great, that we cannot here attempt to enter into the subject. We have given some hints that may be useful to the student; but, to study the art of orchestral combinations with most pleasure and most advantage, one must have recourse to the Partitions of the best German and Italian composers of operatic and orchestral music, from Gluck and Piccini downwards to Haydn, Mozart, Cherubini, Beethoven, Spohr, Rossini, Weber, &c. In studying the Partitions of some of the latest composers, one should guard against being led away by the love of noise and the affectation of singularity too often found in them.

If even what we have had space for upon a subject so extensive as Music should be of use to the young professional student, or to the real amateur, our object—the advancement of music in our native country—will be so far attained. We conclude by requesting the musical student to keep in view that there is no royal road to a true knowledge of his art; and also that in music, as well as in other things, Condillac's observation holds true: "*Les règles sont comme des garde-fous mis sur les ponts, non pas pour faire marcher les voyageurs, mais pour les empêcher de tomber.*" (G. F. G.)

Musimon ‖ Musschenbroek.

MUSIMON, in *Natural History*, the name of an animal, esteemed a species of sheep, and described by the ancients as common in Corsica, Sardinia, Barbary, and the north-eastern parts of Asia. It has been doubted whether the animal described under this name is now anywhere to be found in the world, and whether it was not probably a spurious breed between two animals of different species, perhaps the sheep and goat, which, like the mule, was not able to propagate its species, and hence the production of them may have been discontinued. Buffon supposes it to be the sheep in a wild state; and it is described as such by Mr Pennant. These animals live in the mountains, and run with great swiftness amongst the rocks. Those of Kamtschatka are so strong that ten men can scarcely hold one, and the horns are so large as sometimes to weigh thirty pounds, and so capacious that young foxes often shelter themselves in the hollow of such as by accident fall off in the deserts.

MUSK, a very strong-scented substance, found in a bag under the belly of a species of moschus. See MAMMALIA.

MUSKAU, a town of Prussian Silesia, in the government of Liegnitz. It is the capital of a mediatized principality, and the residence of the prince. It is a neat town, built since 1766, and contains two churches, 200 houses, and 1550 inhabitants. The principality consists of forty-six villages and 8500 people.

MUSKET, or MUSQUET, properly a fire-arm borne on the shoulder, used in war, and discharged by the application of a lighted match. Muskets were anciently borne in the field by the infantry, and were used in England so lately as the beginning of the civil wars. They are not now used; fusees or firelocks having taken their place and name. See the article GUN.

MUSKETOON, a kind of short, thick musket, the bore of which is the thirty-eighth part of its length; it carries five ounces of iron, or seven and a half of lead, with an equal quantity of powder. This is the shortest kind of blunderbusses.

MUSLIN, a fine sort of cotton cloth, which bears a downy knot on its surface. See COTTON and MANUFACTURE.

MUSSCHENBROEK, PETER VAN, an eminent mathematician and natural philosopher, was born at Leyden on the 14th of March 1692. Having studied languages under Perizonius and Gronovius, he applied himself to philosophy, chemistry, and medicine under Senguerd, Bidloo, Le Clerc, Burmann, Albinus, Boerhaave, and Rau, and proved a disciple worthy of such masters. He was received as doctor in 1718, after having published and defended his inaugural dissertation *De Aëris Præsentia in Humoribus Animalium;* a masterly production, containing a record of new experiments carefully performed, and several curious facts discussed with much sagacity. Having visited London, he there became acquainted with Newton and Desaguliers, and was elected a member of the Royal Society; and, on his return to his own country, he was appointed professor of mathematics and natural philosophy at Utrecht, where he remained twelve years (from 1723 to 1735), and acquired the greatest celebrity. In 1739 he succeeded Wittichius in the same situation at Leyden, where he remained till the time of his death, which took place on the 19th of September 1761, at the age of sixty-nine. He published various works in Latin, all evincing great penetration and accuracy. The principal of these are, 1. Epitome Elementorum Physico-mathematicorum, Leyden, 1729, in 4to; 2. Dissertationes Physicæ Experimentalis et Geometricæ, ibid. 1729, in 4to; 3. A Latin translation of the *Saggi di Naturali Esperienze fatte nell' Accademia del Cimento*, Leyden, 1731, in 4to; 4. Elementa Physicæ, 1734, in 8vo, translated in English by Colson, 1744, in two vols. 8vo. His *Introductio ad Philosophiam Naturalem*, which he began to print in 1760, was completed by Lulofs, and published at Leyden in 1762, soon after the death of the author. A translation of this work into French by Rigaud de Lafond was published at Paris in 1769, in three vols. 4to. Musschenbroek had always paid great attention to meteorology, several papers on which, containing numerous observations by him, were printed in the Memoirs of the French Academy of Sciences, and in the Transactions of the Royal Society of London, besides a dissertation on barometers which appeared in the Memoirs of the Academy of St Petersburg. (A.)

Musselburgh.

MUSSELBURGH, a royal burgh, barony of regality, and sea-port town, of Scotland, in the county of Edinburgh, distant six miles south-east from Edinburgh. It is the capital of the parish of Inveresk, and is situated at the mouth of the river Esk, which divides it into two portions; that part on the right side being properly called Musselburgh, whilst the other is called Fisherrow. Musselburgh consists of one long street, called the High Street; the centre part of which is very spacious, and has, like most of the old burghs, a building placed there, containing the town-house, jail, and other offices connected with the conducting of the business of the burgh. This is an old erection, but it has of late been partly renewed, and much improved in appearance. The houses in the High Street, as well as in the bye-streets and lanes, are well built; and perhaps in no town in Scotland of the same size are there so many comfortable self-contained houses. The connection with Fisherrow is maintained by two stone and two wooden bridges. The uppermost bridge consists of three arches. It is of great antiquity, and was built by the Romans, most probably at the time when they had their station at Inveresk Mount. It was formerly a pass of some moment; and, in addition to being narrow and high, it was defended by a gate placed in the centre. This interesting old bridge is now only used by foot passengers. Further down the river, on the line of the main road, a handsome and commodious bridge has been erected, after a design by Rennie. Fisherrow, formerly the site of a Roman town, consists of one long main street, a back street next the sea, and a variety of small streets that branch from them. A handsome row of houses has lately been built on the road from the main street to the new bridge over the Esk. There is also on the bank of the river a neat row of houses, with a promenade in front tastefully planted. The harbour is small, but has been lately improved by the construction of a good stone pier. It is principally used for the importation of timber, the shipping of coals, and the accommodation of fishing-boats. Small vessels are occasionally built at the port. Close to Musselburgh are the small villages of Newbigging and Inveresk, which, from their continuity, may be said to form part of that town. Inveresk is noted as being a station of the Romans. In the years 1565 and 1783, remains of the ancient buildings were discovered, which clearly pointed out the spot where the prætorium had been reared. At the west end of the village, and on a prominent part of the Mount, stands the parish church, built upwards of thirty years ago, to replace one of very old date, supposed to have been erected out of the ruins of the Roman fort.

There is an extensive piece of ground belonging to Musselburgh, stretching between Pinkie and the sea, called the Links, which is much frequented for playing the game of golf. It is also used as a race-ground for the Edinburgh races. To aid this object, an excellent stand has been erected at the western extremity of the course. The chief business of the town is the tanning of leather and preparing of skins. There are various small manufactories for yarns, haircloth, shawls, and hats; also for working fishing-nets on the loom, and making bricks, tiles, and coarse earthen-ware. Besides these, there are several breweries, and a number of

Mussomeli ‖ Mussulman.

flour-mills. Market-gardening is carried on as a trade, with the view of supplying Edinburgh. Musselburgh has long possessed an excellent grammar-school, and two English schools, one of them in Fisherrow, all under the patronage of the magistrates. A variety of boarding-schools for young ladies, and some private schools for the elementary branches, have for many years been established. The inhabitants support three public libraries, all of which contain an excellent collection of books. In addition to the parish church at Inveresk, a new church was erected in 1837, in Bridge Street, called the North Esk Church, to which a separate parish has been allotted. Besides these, there are meeting-houses of the Relief, Independent, United Associate, and Baptist bodies; as also an Episcopal chapel.

At the east end of Musselburgh formerly stood the celebrated chapel of Loretto, of which only one cell now remains, covered by an artificial mount, in a garden still called by the ancient name. It must have been a place of considerable size, as the jail of the town was built from its ruins. This town is of very ancient foundation. King Malcolm Canmore granted Little Inveresk to the abbey of Dunfermline, which was afterwards confirmed by King David I. who added Great Inveresk to the gift. This latter gift included the burgh and port of Musselburgh. It was by that wealthy body erected into a burgh of regality. At the Reformation the whole of the property belonging to the abbey was erected into a lordship, and granted to Lord Thirlstane, whose heir, Lord Lauderdale, confirmed the charter already granted by the abbey. This charter was again confirmed by Charles II. in 1671, and under this last confirmation the property of the burgh is now held. From the same charter it also derives its title as a royal burgh. The burgh formerly possessed extensive property, but the greater part of it was sold or feued many years ago. What now remains was valued in the year 1833 at L.35,000. The debts in the same year were estimated at L.12,123. The yearly income is about L.2000, and the expenditure is under that sum. The revenues drawn from Fisherrow port average between L.250 and L.300. The burgh is governed by a provost, three bailies, a treasurer, and seven councillors, some of them being returned by Fisherrow. The population in 1831 was 8961, of whom 4257 were males, and 4704 females. Musselburgh, Fisherrow, Portobello, Leith, and Newhaven, return a member to parliament.

MUSSOMELI, a city in the island of Sicily, in the kingdom of Naples, and province of Mazzara, fifty miles from Palermo. It stands on the side of a large inland mountain; and the inhabitants, who are 9276, depend chiefly on the cultivation of the surrounding soil.

MUSSULMAN, or Moslemin, a title by which the Mahommedans distinguish themselves, and which signifies, in the Turkish language, true believer, or orthodox. In Arabic the word is written *Moslem*, *Moslemin*, or *Mosulman*. The appellation was first given to the Saracens, as is observed by Leunclavius. There are two kinds of Mussulmans, very averse to each other; the one called *Soonites*, and the other *Sheeites*. The Soonites follow the interpretation of the Koran given by Omar; the Sheeites are the followers of Ali. According to some authors, the word Mussulman signifies "saved," that is, predestinated; and hence the Mahommedans give themselves the appellation, as believing they are all predestinated to salvation. Martinius is more particular as to the origin of the name, which he derives from the Arabic *Musalem*, "saved," or "snatched out of danger." The Mahommedans, he observes, established their religion by fire and sword, massacred all those who would not embrace it, and granted life to all who did, calling them *Mussulmans*, as much as to say, *erepti e periculo;* and hence the word, in course of time, became the distinguishing title of all those of that sect who have affixed to it the signification of "true believers."

Must ‖ Mutis.

MUST, Mustum, sweet wine newly expressed from the grape, or the new liquor expressed from the fruit before it is fermented.

MUSTER, in a military sense, a review of troops under arms, to ascertain if they be complete and in good order; to take an account of their numbers, examine the condition they are in, view their arms and accoutrements, and investigate other matters.

Muster-*Rolls*, lists of soldiers in each company, troop, or regiment, by which they are paid, and the strength of the army is known.

MUTATION, the act of changing, or sometimes the change itself.

Mutation, in the ancient music, is applied to the changes or alterations which happen in the order of the sounds composing the melody.

MUTATIONES, amongst the Romans, post stages or places where the public couriers were supplied with fresh horses. The *mutationes* were wholly designed for the use of these couriers or messengers of state, and in this respect they differ from *mansiones*.

MUTCHKIN, a liquid measure used in Scotland, containing four gills, and forming the fourth part of a Scotch pint.

MUTE, in a general sense, signifies a person who cannot speak, or has not the use of speech.

Mute, in *Grammar*, a letter which yields no sound without the addition of a vowel. The simple consonants are distinguished into mutes and liquids, or semi-vowels. The mutes in the Greek alphabet are nine, three of which, π, κ, τ, are termed *tenues;* three, β, γ, δ, *mediæ;* and three, φ, χ, θ, *aspiratæ*. The mutes of the Latin alphabet are also nine, viz. B, C, D, G, I, K, P, Q, T.

MUTILATION, the retrenching or cutting away any member of the body.

This word is also extended to statues and buildings, where any part is wanting, or the projection of any member, as a cornice or an impost, is broken off. But it is sometimes used in a more immediate manner to signify castration.

MUTINY, in a military sense, is open disobedience of, and resistance to, authority. Any officer or soldier who presumes to use traitorous or disrespectful words against the sacred person of his majesty, or the royal family, is guilty of mutiny. Any officer or soldier who behaves himself with contempt or disrespect towards the general or other commander-in-chief of our forces, or speaks words tending to their hurt or dishonour, is guilty of mutiny. Any officer or soldier who begins, excites, causes, or joins in, any mutiny or sedition, in the troop, company, or regiment to which he belongs, or in any other troop or company in our service, or in any party, post, detachment, or guard, on any pretence whatsoever, is guilty of mutiny. Any officer or soldier who, being present at any mutiny or sedition, does not use his utmost endeavours to suppress the same, or, coming to the knowledge of any mutiny, or intended mutiny, does not, without delay, give information to his commanding officer, is guilty of mutiny. And any officer or soldier who strikes his superior officer, or draws, or offers to draw, or lifts up any weapon, or offers any violence against him, being in the execution of his office, on any pretence whatsoever, or disobeys any lawful command of his superior officer, is guilty of mutiny.

MUTIS, Joseph Celestino, an eminent natural historian, but peculiarly distinguished for the ardour of his botanical researches, was a native of Spain, and born at Cadiz on the 6th of April 1732. His parents were respectable inhabitants of that city, and conferred on him the best elementary education that could be acquired in Andalusia. His first instructions were received in the College of San Fernando, in his native city, and thence he was removed to the

Mutis. University of Seville. In both these seminaries he was distinguished, as well by his application and talents, as by the modesty of his demeanour. He attended the classical and mathematical course as taught in the latter seminary, as well as to the study of theology; and during his residence there, he sedulously applied himself to anatomy, medicine, and natural history. The ardour he displayed for this class of pursuits was great, so that when he removed to Madrid in 1757, he had made such progress as to enable him to become a lecturer on anatomy. It was then usual for the court of Madrid to select some promising young men, and send them to Leyden, Paris, or Bologna, to improve their faculties, and advance their knowledge of the sciences. Mutis was selected for this purpose; but about the same period Don Pedro Messia de la Cerda was appointed viceroy of New Granada, and proposed to the ardent naturalist to accompany him, in the quality of physician, to that interesting country. His natural modesty and love of retirement induced him to relinquish the opportunity of visiting different countries, and thereby increasing his knowledge in Europe, and to devote himself to the examination and description of those objects of natural history which the mountains of South America presented, and which had previously been scarcely explored by any scientific European.

He embarked with the viceroy, and landed at Carthagena in the year 1760. The various new productions that met his eye at every point in that hot climate did not detain him from ascending towards the mountain plain, where, at the city of Santa Fé de Bogota, he fixed his abode.

He had scarcely reached the destined place of his residence, before he began to arrange his plan for the collection of those plants to the study of which he was attached, and the descriptions of which formed the delight of his life, and the basis of his future fame. He soon began a correspondence with Linnæus, which continued during the life of that celebrated man, who procured his admission to the academy at Stockholm. His accuracy, diligence, and enthusiasm were highly estimated by the Swedish botanist, who felt, in the eulogiums he paid him, that he very imperfectly gratified his own sentiments of respect and admiration.[1] His skill was speedily known throughout Europe by all the botanists of considerable eminence, as his discoveries were communicated to many of them through the extensive correspondence which he maintained.[2]

At the time Mutis arrived at Santa Fé de Bogota, that capital was in profound ignorance of science; and even in the university, the true system of the universe was so little known, that he is represented as having encountered great difficulties, when he first taught that the world turned upon its own axis, revolved round the sun, and was in reality only a planet of the solar system. With the approbation of the viceroy, he began to dispense mathematical, and especially astronomical knowledge, to the pupils in the college of the Rosario; and he had the satisfaction, long before the close of a protracted life, to see a race of scholars formed on the principles of the Newtonian philosophy, in spite of the anxious and alarming fears of their parents, who, on its first introduction, considered it as impious, or at least heretical.

He continued diligently exploring the Andes for every vegetable production, during the intervals of instruction in astronomy, and continued both pursuits with unabated ardour. When his patron Cerda had finished the period of his viceroyship, he proposed to Mutis to return with him to Spain; but he was so much fascinated with the solitude of the vast woods and extended plains, with the features of nature displayed on the boldest scale, and the deep azure of the unclouded sky, that he determined, under their favouring auspices, to spend the remainder of his life in South America, in the contemplation of vegetation and of the starry world. His studies, instead of producing scepticism, strengthened his religious faith, and, under its influence, he entered into holy orders in 1772. From that period he divided his time between religion and the sciences; and whilst in the former he was a model of ecclesiastical virtue, he displayed in the latter the qualities of a genuine philosopher. Mutis.

It was a fortunate circumstance, both for the science of botany and for the fame of Mutis, that the court of Madrid felt a peculiar interest in the promotion of that study, and appointed commissioners in each of its extensive dominions in America, to investigate, arrange, describe, and draw their various productions. Mutis was appointed president of the botanical board for the viceroyalty of Santa Fé, and commenced his operations by the project of that great work the *Flora of Bogota*, which only the munificence of a government could enable him to undertake. In 1782, he selected the spot most favourable for executing this great design, and, judging the central situation of Mariquita, at the foot of the mountains of Quindiu, to be the best adapted for his purpose, he removed thither, and resided in that place for the succeeding seven years, in pursuance of his plan of study. The place was admirably chosen; for though at the foot of the Andes, it is on a high level, and in a temperate climate; and, being in the vicinity of the river Magdalena, though considerably higher, it has the advantage of easy access to every degree of temperature, and to all the various family of plants which the greatest possible differences of climate can produce. In this secluded town, he and his pupils were constantly employed in roaming in the extensive plains, penetrating the thickest woods, scaling the highest mountains, and at times encountering the severe heat of the valleys, whilst collecting every rarity of the vegetable kingdom. He there created a class of painters, who drew the plants as they were collected; and he had a school of engraving, in which were executed some of those large plates, which have excited so much admiration amongst the botanists and artists of Europe. The state of his health, arising principally from the exertions he made and the hardships he encountered in these pursuits, induced him to remove from Mariquita in 1772, and fix his residence again in the capital, to which he was also drawn by the desire of being nearer to a greater number of artists than could be collected in the retired spot from whence his exploratory journeys had been directed. His labours in perfecting the *Flora* were continued with unabated industry till the end of his life; and, after his decease, the work was continued by some of his pupils, though it received serious interruptions from the civil wars, in the course of which some of those appointed to continue it were cut off amidst the contests of the various revolutionary factions. Amongst these is particularly to be regretted Don Francisco Caldas, who was endeared to Mutis, and most nearly resembled him in his industry, and his attachment to the study of natural history. Besides the great work, the *Flora*, Mutis finished one on the history of the trees of the quina species, and exercised his great acuteness in the investigation of the

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[1] In memoriam Josephi Cœlestini Mutis, Americes summi Botanici, qui historiam plantarum Americanarum, in primis palmarum, pulcherrimam parat, et plurima nova hinc opuscula communicavit. (Linn. *Suppl.* p. 57.) Nomen immortale quod nulla ætas unquam delebit. (Linn.)

[2] Cavanilles, in writing, thus expresses himself: "In honorem sapientissimi viri (J. C. Mutis) qui jure merito Botanicorum in America princeps salutatur, debetque etiam inter primates Europeos colocari."

Mutus.

varieties of that family, the bark of which has introduced a new era in the practice of medicine.

Amidst his botanical labours, Mutis never neglected his astronomical observations and experiments. It had often been suggested by philosophers in Europe, that the moon had probably an influence on the barometer, similar to what it exercises on the tides. The situation of Santa Fé was favourable for a variety of experiments, which Mutis conducted, and by which he ascertained the fact so clearly, as to remove all doubts on the subject. He was instrumental in obtaining powers from Madrid for the construction of an observatory on the summit of the Andes, at a far higher elevation than any of the observatories of Europe are placed. He had remarked, that the blue of the firmament appears darker in proportion to the elevation at which the observer stands, and that on the highest attainable situations, the sky seems almost black; so that the stars shine with a brilliancy uninterrupted by clouds, and, even in day-light, are visible without the help of glasses.

He deemed the position favourable for astronomical observations, and especially for those of the fixed stars; for being near the equator, it commanded a view of the constellations both of the northern and southern hemispheres; and, from its height, the observer is little liable to interruption from intervening clouds, or to errors from the inconstancy of the refractions. At his earnest recommendation, and under his inspection, the observatory was begun in 1802, and finished in the following year. Some instruments were collected in the country, and others were ordered from Europe. The first were, as may be supposed, destitute of those improvements which have been more recently introduced; and it unfortunately happened, that some of those exported from Europe were lost on the passage. The apparatus had not been completed when Mutis died, and the political storms which since agitated that country have prevented the completion of the collection. The founder had, however, directed the course of observations to be prosecuted with as much attention as the imperfection of the instruments would admit. Though the wise intentions of Mutis have been delayed, we may hope that they have not been frustrated, but may look forward to a time when the catalogue of fixed stars in the southern hemisphere shall be considerably augmented, and their positions determined with the greatest accuracy. In the mean time, some astronomical and meteorological observations have been made and published, in a periodical register, and the exact latitude and longitude of the observatory has been determined. Its elevation above the level of the ocean, as determined by barometrical observations, frequently repeated, is 9416 feet. As this observatory is the first erected in South America, and as it stands much higher than any other that ever was constructed, if its advantages shall be properly improved, it will be a benefit to science, and a durable monument to the fame of its founder.

Mutis enjoyed good health throughout a long life, which was closed in a manner worthy of a philosopher and a Christian, without pain or struggle, on the 11th of September 1808. He left various manuscript works on plants, on meteorology, and on mining; an herbarium of upwards of 20,000 plants, more than 5000 drawings of plants, and a large collection of woods, of shells, of minerals, and skins of animals. He had also a very extensive collection of oil-paintings, of all the various animals of the viceroyalty, coloured in exact conformity to nature. It was the last wish he expressed, that his valuable collections might furnish the basis of a national museum; but the turbulent season which commenced soon after his death, and the unsettled state in which public affairs subsequently continued, have hitherto prevented the fulfilment of his wishes. (See *El Espanol. Diario de Santa Fé.*)

MUTIUS, Caius, surnamed *Codrus*, and afterwards *Scævola*, was one of the illustrious Roman family of the Mutii, and rendered his name famous in the war between Porsenna king of Tuscany and the Romans. That prince having resolved to restore the family of Tarquin the Proud, went to besiege Rome in the year 507 before Christ; but Mutius determined to sacrifice himself for the safety of his country, and boldly entering the enemy's camp, killed Porsenna's secretary, whom he took for Porsenna himself. Being seized and brought before Porsenna, he told the king boldly, that three hundred young men like himself had sworn to murder him; "but since this hand has missed thee," continued he, "it must be punished;" then putting his right hand on the burning coals, he let it burn with such constancy as astonished the beholders. The king, amazed at the intrepidity of the young Roman, ordered that he should have his freedom and return to Rome, and soon afterwards concluded a peace with the Romans. From this action Mutius obtained the surname of *Scævola*, or left-handed, which was enjoyed by his family.

Mutius ‖ Mycale.

Mutius *Scævola*, *Q.* surnamed the *Augur*, was an excellent civilian, and instructed Cicero in the laws. He was made prætor in Asia, and afterwards became consul, when he performed important services for the republic. He must not be confounded with Quintus Mutius Scævola, another excellent civilian, who was prætor in Asia, tribune of the people, and at length consul, 95 before Christ. He governed Asia with such prudence and equity, that his example was proposed to the governors who were sent into the provinces. Cicero says of him, that he was the most eloquent orator of all the civilians, and the most able civilian of all the orators. He was assassinated in the temple of Vesta during the wars of Marius and Sylla, eighty-two years before Christ.

MUTTON, the common name of the flesh of a sheep after the animal has been killed. Mutton has been commonly preferred to the flesh of all quadrupeds; and, indeed, besides being more perfect, it has the advantage of being more generally suited to different climates, whereas beef, for instance, requires a very nice intermediate state, which it seems to attain chiefly in England; for although Scotland supplies what are reckoned the best cattle, it is in the rich English pastures that they are brought to perfection. But the sheep can be brought almost to the same perfection in this northern region as in the southern countries.

MUTUAL, a relative term, denoting something that is reciprocal between two or more persons. Thus we say, *mutual assistance, mutual aversion.* There are mutual or reciprocal duties, offices, and the like, between superiors and inferiors, as the king and his subjects, the master and his servants, &c. Vaugelas makes a distinction between *mutual* and *reciprocal; mutual*, according to him, being understood of what is between two only; and *reciprocal*, of what is between more than two. But this distinction is little regarded in common usage.

MUTULE, in *Architecture*, a kind of square modillon set under the cornice of the Doric order.

MUTUNUS, or Mutinus, in fabulous history, a deity amongst the Romans, similar to the Priapus of the Greeks.

MUZZLE *of a* Gun *or* Mortar, the extremity at which the powder and ball is put in; and hence the muzzle ring is the metallic circle or moulding which surrounds the mouth of the piece.

MYCALE, a city and mountain of Caria, and also a promontory of Asia, opposite Samos, celebrated for a battle which was fought there between the Greeks and Persians about the year of Rome 275. The Persians, about 100,000 strong, had just returned from the unsuccessful expedition of Xerxes in Greece; and having drawn their ships to the shore, they had fortified themselves strongly, as if determined to support a siege. They suf-

Mycenæ ‖ Myiagrus Deus.

fered the Greeks to disembark from their fleet without the least molestation, and were soon obliged to give way before the cool and resolute intrepidity of an inferior number of men. The Greeks obtained a complete victory, slaughtered some thousands of the enemy, burned their camp, and sailed back to Samos with an immense booty, in which were seventy chests of money.

MYCENÆ, in *Ancient Geography*, a town of Argolis, in Peloponnesus. The kingdom of the Argives was divided into two portions by Acrisius and his brother Prœtus, and Argos and Mycenæ were their capitals. These, as belonging to the same family, and distant only about fifty stadia, or six miles and a quarter from each other, had one tutelary deity, Juno, and they were joint proprietors of her temple, the Heræum, which was near Mycenæ. It was here that Agamemnon reigned. He enlarged his dominions by his valour and good fortune, and possessed, besides Mycenæ, the region about Corinth and Sicyon, and that which was afterwards denominated Achæa. On his return from Troy, he was slain with his companions at a banquet. Mycenæ then declined, and under the Heraclidæ was made subject to Argos. The Mycenæans, having furnished eighty men, partook with the Lacedæmonians in the glory acquired at Thermopylæ. The jealousy of the Argives produced the destruction of their city, which was abandoned after a siege, and laid waste in the first year of the seventy-eighth Olympiad, or 466 years before Christ. Some part of the wall remained in the second century, with a gate, upon which were lions, a fountain, the subterranean edifices where Atreus and his sons had deposited their treasures, and, amongst various sepulchral monuments, one of Agamemnon, and another of his fellow-soldiers and sufferers.

MYCONDAH, a town of Hindustan, in the territories of the rajah of Mysore. It is of some importance, as it is placed at the entrance of a pass from the north-westward into the valley of Chitteldroog, which it is intended to defend. It is 138 miles N. N. W. from Seringapatam. Long. 76. 10. E. Lat. 14. 16. N.

MYCONE, an island of the Archipelago, situated in long. 25. 51. E., lat. 37. 28. N. It is about thirty-six miles in circuit, and has a town of the same name.

MYCONUS, in *Ancient Geography*, one of the islands called Cyclades, near Delos, under which the last of the centaurs slain by Hercules are feigned to lie buried. Hence the proverb, *Omnia sub unam Myconum congerere*, applied to an injudicious or unnatural farrago.

MYDAN, a small district in the Afghan province of Cabul, situated between the 33d and 34th degrees of north latitude.

MYER, a town of Hindustan, in the province of Allahabad, fifty miles south-south-east from Callinger. Long. 80. 50. E. Lat. 24. 21. N.

MYIAGRUS Deus, in the heathen mythology, a name sometimes given to Jupiter, and sometimes to Hercules, on occasion of sacrifices being offered to them for driving away the vast numbers of flies which infested the victims on certain public occasions. The word is usually spelt *Myagrus;* but this must be an error, as the word does not express the "fly-destroyer," but the "mouse-destroyer," and it is sufficiently testified by the ancients, that flies were the only creatures against whom this deity was invoked. Pliny calls this deity *Myiodes*, and tells us that the flies which used to pester the Olympic rites went away in clouds on the sacrificing of a bull to this god. We find in Athenæus, also, that this sacrificing to the god of flies at the Olympic games was a constant custom. Some authors distinguish these two deities, and tell us that the latter, or Myiodes, used to visit the nations in vengeance with a vast multitude of flies, and that, upon paying him the due honours of a sacrifice, they all went away again; and this seems to agree with what Pliny mentions in several places. At the time of the Olympic games, Jupiter was worshipped under the name of *Apomyos* or *Myiagrus Deus*, and supplicated to effect the destruction of these troublesome creatures. This happened only once in many years, when the sacrifices were performed there; but the Elians worshipped him continually under this name, deprecating the vengeance of heaven, which usually sent, towards the latter end of summer (as they expressed it) an army of flies and other insects, which infested the whole country with sickness and pestilence.

Myiodes Deus ‖ Mymunsing.

MYIODES Deus, in the heathen mythology, a name sometimes given to Hercules, but more frequently to Jupiter, to whom a bull was sacrificed, in order to render him propitious in driving away the flies which infested the Olympic games.

MYLASA, or Mylassa, in *Ancient Geography*, a noble city of Caria, in Asia Minor, situated about three leagues from the *Sinus Ceramicus*. It was the capital of Hecatomnus, king of Caria, and father of Mausolus. Pliny, speaking of Menander king of Caria, says that the Rhodians preserved with the greatest care his portrait painted by Apelles. But it was not in honour of this Menander that a Corinthian pillar was erected at Mylasa, which still exists, and on which is to be seen the following inscription: "The people erected this pillar in honour of Menander, the son of Uliades, and grandson of Euthydemus, the benefactor of his country, and whose ancestors also rendered it great services." Caria was taken by Mithridates, and afterwards by Labienus, whose father had been one of Cæsar's generals. Hybrias, whose eloquence and valour deservedly entitled him to a distinguished rank amongst his countrymen, in vain encouraged them to make an obstinate defence whilst it was besieged by the latter. He himself was obliged to yield to necessity, and to take refuge at Rhodes; but scarcely had the conqueror quitted the city, when Hybrias returned and restored liberty to his country; and, not content with rendering it this service, he also destroyed the power of a dangerous citizen, whose riches and talents had rendered him a necessary evil. Euthydemus, often banished, and as often recalled, but always too powerful in a state the independence of which he threatened, saw his ambition checked by the zeal and activity of Hybrias. The Romans left to Mylasa that liberty of which it rendered itself so worthy by the great efforts it made to preserve it. Pliny calls it *Mylasa libera;* and Strabo informs us that it was one of the most magnificent cities of antiquity, the temples, porticoes, and other public monuments of which were highly admired. This city is now called *Melasso*. When Pococke visited this place it was perfect and entire; but at present no traces of it remain.

MYLAU, a town of the circle of Voightland, in the kingdom of Saxony, on the river Golzsch. It contains 240 houses, and 1790 inhabitants, who are chiefly employed in making muslins and cotton goods.

MYMUNSING, a district of Hindustan, in the province of Bengal, situated between the 24th and 28th degrees of north latitude. The boundaries of this territory are the Garrow Mountains and the district of Rungpoor on the north, Dacca Jelalpoor on the south, Silket and Tipperah on the east, and Ranjeshy and Dinagepoor on the west. The country is intersected by the great river Brahmapootra, into which flow innumerable streams from both sides; and, owing to the flatness of the country, it is liable to inundations during the rainy seasons. It produces in consequence very abundant crops of rice, of a coarse quality, which is its staple produce. Some parts of the country are overrun with wood or jungle, and are but thinly inhabited. The chief town is Bygonbary, which is the residence of the judge and collector, who are subordinate to

Myo Isle ‖ Myriapoda.

the Dacca court of circuit. The population consists of pretty nearly equal numbers of Hindus and Mahommedans. According to a census taken by orders of the Marquis Wellesley in 1801, the population amounts to 600,000.

MYO ISLE, a small island situated in the Eastern Seas, in the Molucca passage, which separates Celebes and Gilolo. The inhabitants, by whom it was occupied whilst the Portuguese held the Moluccas, were expelled by the Dutch, lest it should become a place for the smuggling of spices. Long. 126. 15. E. Lat. 1. 23. N.

MYOLOGY (formed of μυς, μυος, *a muscle*, and λογος, *discourse*), in anatomy, signifies a description of the muscles, or the knowledge of what relates to the muscles of the human body. See ANATOMY.

MYOMANCY, a kind of divination, or method of foretelling future events by means of mice. Some authors hold myomancy to be one of the most ancient kinds of divination, and think it is on this account that Isaiah (lxvi. 17) reckons mice amongst the abominable things of the idolaters. But besides that it is by no means certain that the Hebrew word עכבר used by the prophet signifies *a mouse*, it is not the divination by that animal, whatever it may have been that is spoken of by the prophet, but the eating it, that is forbidden.

Myomancy ‖ Myriapoda.

MYOPIA, SHORT-SIGHTEDNESS, a species of vision in which objects are seen only at small distances.

MYRIAD, a term sometimes employed to denote ten thousand.

MYRIAPODA,

A WINGLESS tribe of insects, formerly so called, of which *centipedes* (the genus SCOLOPENDRA of Linnæus) form the most characteristic example, are now regarded as a separate class of the articulated tribes, in conformity with the views of Dr Leach and other writers who have studied their structure and economy. Under this title, therefore, as formerly intimated,[1] we shall present the reader with a brief notice of the principal genera, of which the prevailing forms have been already exhibited (in connection with our representations of insects) on Plate CCXXXIX. of this work. We owe the establishment of the class to Dr Leach,[2] M. Lamarck having viewed the Myriapoda as arachnides,[3] while M. Latreille, except in a single work,[4] regarded them as true insects. As such they were likewise included by Linnæus, and the older systematic writers, in the order APTERA.

The Myriapoda are distinguished from true insects by their greater amount of feet (twenty-four and upwards), by the want of any precise or appreciable division into thorax and abdomen, and by the numerous segments into which their bodies are divided. Each segment, with the exception of the first, is furnished with a pair of legs, terminated for the most part by a single hook. The stigmata, or openings for respiration, are placed on each alternate segment, a circumstance which has induced some observers to regard the latter as only semi-segments, in as far as in true insects each ring has its pair of stigmata. But we see no necessity for the establishment of any strict analogy of form between the subjects of two distinct classes of articulated beings; and indeed, if we do so in regard to the character in question, we produce a greater discordance by the necessity, in that case, of assigning to each so-called (double) segment, a couple of pair of legs. The mandibles are bi-articulate, and are followed by a piece in the form of a labium, quadrifid, with articulated divisions resembling little feet, and corresponding in position to the *languette* of the Crustacea. Then succeed two pair of small feet, of which the second, sometimes hook-shaped, seem to replace the four maxillæ of the last-named order, or the two maxillæ and the lower lip of insects. They may be regarded as maxillary feet. The antennæ are two in number. Their form cannot be easily generalised, because, although they may often be, as Latreille says, "courtes, un peu plus grosses vers le bout, ou presque filiformes;" yet in some (genus *Scutigera*) they are very long, and become much more slender towards the extremity. The number of the articulations also varies greatly. The organs of vision are usually formed by a union of smooth or simple eyes; but in some these parts are analogous to the compound eyes of insects, the facettes, however, being proportionally larger, rounder, and more distinct. All Myriapodes are apterous.

The subjects of our present notice differ likewise from insects in this remarkable peculiarity, that the number of their segments, and consequently of the stigmata and legs, increases with the size of the individual. It would even appear, from the observations of Savi the younger,[5] that the genus *Iulus* is born without feet; from which it has been observed, that those Myriapodes are subject, at some early period of their lives, to a regular metamorphosis. Degeer had long before observed, that the number of their parts increased with the general growth of the body.

The organs of respiration consist of two principal tracheæ extending parallel along the body, and receiving air from the lateral spiracles.

Myriapodes are generally supposed to be longer lived, and of more continuous growth, than insects; and, according to Savi the younger, two years elapse (at least in the genus *Iulus*) before the development of the generative system; but it must be borne in mind, that many insects exist for a length of time in the larva state (to which the early condition of the Myriapodes so closely corresponds), and are thus of equal longevity with the many-footed subjects of our present inquiry. The Myriapodes in general shun the light. They conceal themselves under stones, beneath the bark of trees, among old timber, and in various other localities. Some inhabit fruits, and others are destructive to culinary vegetables. Many are carnivorous, seizing upon animal substances, both dead and living, with their curved jaws. They are said to infuse a poisonous juice into their wounded victims.

In our subdivision of the class, as in the preceding generalities, we shall follow the system of Latreille, by whom the Myriapodes are partitioned into two primary groups, which differ from each other both in habits and structure.

ORDER I.—CHILOGNATHA.

This primary group corresponds to the genus *Iulus* of Linnæus. The body is for the most part cylindrical, and of a crustaceous consistence. The antennæ are composed of seven joints, of nearly equal size. The mandibles are thick, without palpi, distinctly divided into two portions by a median articulation, and with teeth implanted in a concavity of their upper extremity. Beneath is a kind of labium or lower lip, divided at its exterior surface, by

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[1] See the article ENTOMOLOGY of this work, vol. ix. p. 59, foot note.
[2] Linn. Trans. xi. 376.
[3] *Animaux sans Vertèbres*, v. 24.
[4] *Familles du Règne Animal*, p. 322.
[5] *Memorie Scientifiche*, Pisa, 1828.

Myriapoda.

notches and longitudinal sections, into four principal areas, tuberculated on the upper margin, and of which the two intermediate are short and narrow, and placed at the upper extremity of another area, which serves them as a common base. The feet are very short, and always terminate in a single hook; four anterior feet placed immediately beneath the labium, resemble the others in form, but are more approximate at their base, with the radical joint proportionally longer. Most of the other legs are attached by double pairs to a single segment of the body. The male organs are placed beneath the seventh pair of legs, those of the female behind the second pair. The stigmata, as usually described, are very small, and placed on alternate segments outside the origin of the legs.

The Myriapodes of this division are slow of movement, and advance, as it were, by a gliding motion. They assume in defence a round or spiral form. The first segment of the body, in some the second, is larger than the others, and presents the form of a corselet or buckler. The double pairs of legs do not occur until we reach the fourth, fifth, or sixth pair; the first three or four pair being free from their origin, or adhering to their respective segments only by a median or sternal line. The two or three terminal segments of the body are usually without feet. On each side of the body there is a series of pores, formerly regarded as stigmata, but which, according to M. Savi, merely emit an acid liquor of a disagreeable odour, and probably intended as a means of defence; the true stigmata, or respiratory openings, as described by the Italian naturalist, being placed on the sternal piece of each segment, and communicating internally with a double series of pneumatic pouches, disposed *en chapelet* along the body, and giving out tracheal branches, which ramify over the other organs. These pouches or vesicular tracheæ, according to M. Straus, are not connected with each other, as among ordinary insects, by a principal trachea.

The form of the newly-hatched bodies of the Iulidæ, as observed by M. Savi in the vicinity of Pisa, was somewhat kidney-shaped, quite plain, and without appendages. After the lapse of eighteen days they underwent their first moult, and only then assumed the form of the adults; but they were still composed of only twenty-two segments, and the total number of their legs amounted to twenty-six pair. These observations are in some measure inconsistent with the assertion of Degeer, who in the young state of these creatures counted only three pair of legs and eight segments: but is it certain, asks M. Latreille, that the moult described by M. Savi was actually the first; or ought we not rather to presume that they do not pass suddenly from an apodal state to the possession of twenty-six pair of legs; in other words, that they are subject to certain intermediate changes, which may have escaped the observance of M. Savi?[1] After the second moult, however, the last-named naturalist informs us, the genus *Iulus* exhibits thirty-six pair of legs, and after the third, forty-three, and the body then consists of thirty segments. In the adult state the number is considerably increased. Two years afterwards another moult takes place, and it is only then that the generative system is developed. From the period of birth, which takes place in March, the renewals of the skin were observed by M. Savi to take place almost monthly till November, and the exuviæ were seen to contain even the membrane which lines the interior of the alimentary canal and tracheæ. The organs of the mouth were the only parts not there observed by M. Savi.[2]

Myriapoda.

The food of these Myriapodes consists both of animal and vegetable substances, generally dead and decomposed. They deposit a great number of eggs. The generic groups are as follows. We shall enter into few details, as we have illustrated so many of the prevailing forms by means of accurate figures.

Genus Glomeris, Lat. Body convex above, concave below, with a range of small scales along the lower sides. It is composed of twelve segments, exclusive of the head. The male has thirty-two legs, the female thirty-four.

The species are not numerous. Although *G. ovatus* inhabits the sea, the greater proportion are terrestrial, occurring under stones, particularly in mountainous countries. *G. marginata* (Plate CCXXXIX. fig. 1) is common in most European countries.

Genus Iulus, Lat. Body cylindrical and extended, without any projecting crests or cutting margins.

The larger species are terrestrial, and live in woods; the smaller attack fruits, roots, and various kitchen produce, to some of which they are very destructive. They all assume a spiral position in repose or when alarmed; the head being placed in the centre. Prior to the time of Latreille, this entire division was included under the genus *Iulus*, Linn. But the French naturalist restricted the term to the cylindrical species, and formed of the others his genera *Glomeris*, *Polydesmus*, *Polyxenus*. Various species are described by Dr Leach, in a paper which stands in need of revision.[3] We have here figured *I. sabulosus*, a common European species, Plate CCXXXIX. fig. 3. A monstrous Myriapod is mentioned by Ulloa as inhabiting the district of Carthagena.[4] He describes it (if his terms have not been mistranslated) as sometimes extending a yard in length, and measuring five inches across. Here there is no doubt some gross exaggeration. He adds that its bite is mortal, if a timely remedy be not applied. From its cylindrical form it has been regarded as an Iulus.[5]

Genus Polydesmus, Lat. Body linear, the segments compressed on the under surface, with projecting ridges on the upper, somewhat in the form of transverse oblong scales.

The species of this genus, of which our *Iulus complanatus*, Linn. may be regarded as the type (Plate CCXXXIX. fig. 2), dwell under stones in dampish places. They assume the spiral form when touched, and feed both on animal and vegetable matters in a state of decomposition.

Certain other species, of which the eyes are obvious, form the genus Craspedosoma of Dr Leach.

Genus Polyxenus, Lat. Body soft, membranous, terminated by a tuft of lengthened scales.

The only species of which we have any knowledge is the *Pol. lagurus*, Lat. (Plate CCXXXIX. fig. 5), regarded as a scolopendra by the generality of systematic authors, and described by Degeer under the name of *Iule à queue en pinceau*.[6] It is a very small creature, of rather singular aspect. Our magnified representation just referred to will save the necessity of descriptive details. Its early organization is less complicated than that of the adult state; that is, the young consist of fewer segments and a less number of legs. We know little of its natural habits. It occurs in the clefts of walls, and beneath the bark of old trees.

Order II.—CHILOPODA. Lat.

This division of the Myriapoda bears nearly the same relation to the unrestricted genus *Scolopendra* of Linnæus,

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[1] *Règne Animal*, iv. 332.
[2] See *Osservazione per servire alla storia di una specie di Iulus communissima*, reprinted in *Memorie Scientifiche*, Pisa, 1828.
[3] Linn. Trans. xi. 377.
[4] Voyage, vol. i. p. 61.
[5] Kirby and Spence's Introduction to Entomology, vol. i. p. 128.
[6] *Mémoires*, t. vii. pl. 36.

Myriapoda.

as the preceding does to the genus *Iulus* of the Swedish naturalist. The antennæ become slender towards the extremity, and are composed of fourteen articulations and upwards. The mouth is composed of two mandibles, each furnished with a small palpiform appendage, and exhibiting in their centre the appearance of a joining, and ending in a spoon-shaped termination, with toothed edges. The labium is quadrifid, with the two lateral divisions larger than the others, transversely ringed, and resembling the membranous feet of caterpillars. This labium is analogous to the lower lip of the chilognathous kinds, which represents in Latreille's opinion the tongue of the crustaceous tribes, but possesses also the functions of maxillæ. It is what Savigny names the first auxiliary lip. Besides these parts, there are two palpi or minute feet, united at the base, and unguiculated at the point; a second labium (*seconde lèvre auxiliare* of Savigny[1]), formed by a second pair of feet dilated and joined at their origin, and terminated by a strong hook, moveable, and pierced at the extremity, for the transmission of a venomous or acrid liquid.

The body of these unseemly creatures is depressed and membranous. Each ring or segment is covered by a coriaceous plate, and usually bears only a single pair of legs; and the terminal segment is generally thrown backwards, and elongated into a kind of tail. The organs of respiration are composed, either in whole or in part, of tubular tracheæ. The sexual parts are interior, and placed at the posterior extremity of the body, as in the generality of insects properly so called. The stigmata are more obvious than in the preceding family, and are either lateral or dorsal.

The species of this division are of much more nimble habits than those of the preceding; and the peculiar mode in which the limbs act produces an undulating lateral motion. They are of carnivorous habits, and, avoiding strong light, usually conceal themselves under stones or old timber, beneath the bark of trees, &c. They are held in some dread by the inhabitants of tropical countries, where they attain a great size, and are consequently capable of inflicting dangerous wounds. But the majority of travellers seem agreed that, although the bite is more painful than that of a scorpion, it is never attended by fatal consequences. In more northern countries they are quite harmless, though disliked in consequence of their repulsive aspect. Our common centipede (*Scolopendra forficata* of Linn.) so frequent in this country under stones, may be mentioned as a familiar example. Leeuwenhoeck, the great Dutch microscopical observer, has described the perforation of the hooks, through which the poison is supposed to flow.

This order (which corresponds to the SYNGNATHA of Latreille's earlier works, the title adhered to by Dr Leach) is divided into the following genera.

The first two have only fifteen pair of legs; and their bodies, when viewed from above, seem to present fewer segments than when examined from below.

GENUS SCUTIGERA, Lamarck.[2] Body covered by eight plates or shields, beneath each of which are two pneumatic pouches or vesicular tracheæ, which receive the air, and communicate with lateral and inferior tracheæ of a tubular form. The under surface is divided into fifteen semi-segments, each bearing a pair of feet terminated by an extremely long, slender, and minutely articulated tarsus. The terminal legs are long, and seem to increase in extent from the foremost to the hindmost pair. The eyes are comparatively large and reticulated. The antennæ are very long and slender, and the palpi projecting and spinous.

Myriapoda.

The species keep themselves concealed during the day in barns, or the unfrequented parts of houses, lying between old planks, or sometimes under stones. They are seen at night running on the outside walls with great velocity, feeding on *onisci*, and various insects. They seem to pierce their prey with their mouth-hooks, and infuse into them a poisonous fluid, which immediately deprives them of life. These Myriapodes make their appearance in great numbers, chiefly in rainy weather. According to Illiger, they are greatly dreaded by the inhabitants of Hungary. The best known European species is the *S. araneoides* (Plate CCXXXIX. fig. 4). It is the *Scolopendra coleoptrata* of Linn. and Fab. Pallas asserts that it was taken by a friend of his among some fuci in the sea;[3] but as all analogy is against its natural occurrence in such a locality, we may infer that it had fallen accidentally from the timbers of a vessel.

GENUS LITHOBIUS, Leach. Body divided into an equal number of segments both above and below, each bearing a pair of legs. The dorsal plates are alternately long and short. The stigmatic openings are lateral.

We have figured our most common species, *L. forficata* (Plate CCXXXIX. fig. 6), a familiarly-known Linnæan scolopendra, as an example of the modern genus. It occurs almost everywhere, throughout the summer season, under stones. The anatomical structure of the genus has been described by M. Leon Dufour.[4]

The remaining generic groups of this order have at least twenty-one pair of legs, and the segments of the body are of nearly equal size, and of similar number, both above and below.

In the genus SCOLOPENDRA, properly so called, there are eight distinct eyes, four on each side, and the basal joint of the terminal legs is armed with small spines. We have no British species, but the south of Europe produces *Scol. cingulata*, which presents almost as formidable an aspect as some of the exotic kinds. The great foreign species (one of which sometimes measures above a foot in length) have been as yet but ill defined, several kinds being no doubt described under the name of *Scol. morsitans*, a native of South America (Plate CCXXXIX. fig. 9). A monstrous species, called *Scol. Plumieri*, is figured in Lister's Journey to Paris, and appears to be also represented in Seba's Thesaurus, under the name of *Millepeda major ex Nova Hispana*. India, and the great eastern islands, produce some very large species; and scolopendræ of alarming size likewise occur on the African continent. The bite of these creatures is said to be dangerous;[5] but it seems that the poison of the wound is allayed by the use of ammonia. M. Amoreux is of opinion that no poisonous power is possessed by any of the European species.[6] The whole are carnivorous and voracious, and, all things considered, they may be regarded as among the ugliest of creeping things. Nevertheless they are not without their advantage to the human race. "I have seen Indian chil-

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[1] This piece is not attached to the head, but to the anterior extremity of the first semi-segment. The two hooked feet form by the union and dilatation of their first article a plate in the form of a labium or mentum, and the same semi-segment bears the two first ordinary feet. (*Règne Animal*, iv. 336.)

[2] Latreille and others have adopted Lamarck's designation, although the title of *Cermatia* had at a prior period been assigned to this generic group by Illiger. See Rossi's *Fauna Etrusca*, t. ii. p. 299.

[3] *Spicilegia Zoologica*, fascic. 9, tab. 4, fig. 16.

[4] *Annales des Sciences Nat.* ii. 81.

[5] *Bulletin de la Soc. Phil.* January 1824, p. 24.

[6] *Insect. Venim.* p. 277.

Myristica.

dren," says Humboldt, "of the tribe of the Chuymas, draw out from the earth and eat millepedes or scolopendræ, eighteen inches long and seven lines broad."[1]

Other species, in which the eyes are obliterated or inconspicuous, and the basal joint of the last pair of legs is free from spines, form the genus CRYPTOPS of Dr Leach.[2] He has described two English species, and nobody appears to have since found any other elsewhere.

Some still more slender kinds, of which the antennæ have only fourteen joints, but the legs are so numerous as sometimes to amount to nearly 300, compose the genus GEOPHILUS of Dr Leach. They are remarkable for their extreme tenuity, and at least one British species is at times beautifully phosphoric. We know not, however, whether it is identical with the *Scol. electrica* figured by Frisch, and described by Geoffroy.[3] Dr Leach has described the indigenous species.[4] They are destructive to fruit and vegetables. (T.)

Myrmidons || Myrmillones.

MYRISTICA, the NUTMEG TREE. The seeds or kernels called *nutmegs* are well known, as they have long been used both for culinary and medicinal purposes. Distilled with water, they yield a large quantity of essential oil, resembling in flavour the spice itself; after the distillation an insipid sebaceous matter is found swimming on the water; and the decoction inspissated gives an extract of an unctuous, very slightly bitterish taste, and with little or no astringency. Rectified spirit extracts the whole virtue of nutmegs by infusion, and elevates very little of it in distillation; hence the spirituous extract possesses the flavour of the spice in an eminent degree.

Nutmegs, when heated, yield to the press a considerable quantity of limpid yellow oil, which, on cooling, concretes into a sebaceous consistence. In the shops we meet with three sorts of unctuous substances, called oil of mace, though really expressed from the nutmeg. The best, which is brought from the East Indies in stone jars, is of a thick consistence, of the colour of mace, and has an agreeable fragrant smell; the second sort, which is of a paler colour, and much inferior in quality, comes from Holland in solid masses, generally flat, and of a square figure; the third, which is the worst of all, and usually called common oil of mace, is an artificial composition of sevum, palm oil, and the like, flavoured with a little genuine oil of nutmeg.

When the fruit is ripe, the natives ascend the trees, and gather it by pulling the branches to them with long hooks. Some are employed in opening them immediately, and in taking off the green shell or first rind, which is laid together in a heap in the woods, where in time it putrefies. As soon as the putrefaction has taken place, there spring up a kind of mushrooms called *boleti moschatyni*, of a blackish colour, and much valued by the natives, who consider them as delicate eating. When the nuts are stripped of their first rind they are carried home, and the mace is carefully taken off with a small knife. The mace, which is of a beautiful red, but afterwards assumes a darkish or reddish colour, is laid to dry in the sun for the space of a day, and is then removed to a place less exposed to his rays, where it remains for eight days, that it may soften a little. It is afterwards moistened with sea water, to prevent it from drying too much, or from losing its oil; but the people are careful not to employ too much water, lest it should become putrid, and be devoured by the worms. It is last of all put into small bags, and squeezed very close.

The nuts, which are still covered with their ligneous shell, are for three days exposed to the sun, and afterwards dried before a fire till they emit a sound when they are shaken; they then beat them with small sticks, in order to remove their shell, which flies off in pieces. These nuts are distributed into three parcels, the first of which contains the largest and most beautiful, which are destined for Europe; the second contains such as are reserved for the use of the inhabitants; and the third contains the smallest, which are irregular or unripe. These last are burned; and part of the rest is employed for procuring oil by pressure. A pound of them commonly gives three ounces of oil, which has the consistence of tallow, and the taste of nutmeg. Both the nut and mace, when distilled, afford an essential, transparent, and volatile oil, of an excellent flavour.

The nutmegs which have thus been selected would soon corrupt if they were not watered, or rather pickled, with lime-water made from calcined shell-fish, which is diluted with salt water till it attain the consistence of fluid pap. Into this mixture are plunged the nutmegs, contained in small baskets, two or three times, till they are completely covered over with the liquor. They are afterwards laid in a heap, where they heat, and lose their superfluous moisture by evaporation. When they have sweated sufficiently, they are then properly prepared, and fit for a sea voyage.

In the island of Banda, the fruit of the nutmeg-tree is preserved entire in the following manner. When it is almost ripe, but previous to its opening, it is boiled in water and pierced with a needle. It is next laid in water to soak for ten days, till it has lost its sour and sharp taste, and then it is boiled gently in a syrup of sugar, to which, if they wish it to be hard, a little lime is added. This operation is repeated for eight days, and each time the syrup is renewed. The fruit, when thus preserved, is put for the last time into a pretty thick syrup, and is kept in earthen pots closely shut.

MYRMIDONS, MYRMIDONES, in *Antiquity*, a people in the southern borders of Thessaly, who accompanied Achilles to the Trojan war. They received their name from Myrmidon, a son of Jupiter and Eurymedusa, who married one of the daughters of Æolus, son of Helen. His son Actor married Ægina, the daughter of Æsopus, and gave his name to his subjects, who dwelt near the river Peneus in Thessaly. According to some, the Myrmidons received their name from their having arisen from ants or pismires, upon a prayer put up for that purpose by Æacus to Jupiter, after his kingdom had been dispeopled by a severe pestilence. According to Strabo, they received it from their industry, because they imitated the diligence of the ants, being like them indefatigable, and continually employed in cultivating the earth.

MYRMILLONES were gladiators of a certain kind at Rome, who fought against the Retiarii. Their arms were a sword, head-piece, and shield. On the top of the head-piece they wore a fish embossed, called μορμυρος, whence their name is by some supposed to be derived. The Retiarii, in their engagements, made use of a net, in which they endeavoured to entangle their adversaries; and sung during the fight, *Non te peto, piscem peto; quid me fugis, Galle?* "I aim not at thee, but I aim at thy fish; why dost thou shun me, Gaul?" The Myrmillones were called Galli, because they wore Gallic armour; and they were also named *Secutores*. This kind of gladiators was suppressed by Caligula.

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[1] Personal Narrative, vol. ii. p. 205.
[2] Zoological Miscellany, vol. iii.
[3] *Histoire des Insectes*, t. ii. p. 676, n. 5.
[4] Linn. Trans. xi. 384.

Myrobalans || Mysia.

MYROBALANS, a species of medicinal fruit brought from the Indies, of which there are five kinds, viz. the citrine of a yellowish red colour, hard, oblong, and the size of an olive; the black or Indian myrobalan, of the size of an acorn, wrinkled and without a stone; chebulic myrobalans, of the size of a date, pointed at the end, and of a yellowish brown; emblic, which are round, rough, of the size of gall, and of a dark brown; and balleric, which are hard, round, of the size of an ordinary prune, less angular than the rest, and yellow. They are all slightly purgative and astringent. The word comes from the Greek μυρον, *ointment*, and βαλανος, *acorn*, from their being in the form of acorns, and used in medicine.

MYRON, an excellent Grecian statuary, who flourished 442 years before Christ. The cow he represented in brass was an admirable piece of workmanship, and proved the occasion of many fine epigrams in Greek.

MYRRH, a gummy, resinous, concrete juice, which is brought from the East Indies or from Abyssinia. It is affirmed by some that the myrrh we have at present is not equal in quality to that of the ancients, and has not that exquisite smell which all authors ascribe to the latter. With it they aromatized their most delicious wines; and it was presented as a very valuable perfume to our Lord whilst he lay in a manger. It was this gum also which was mingled with the wine given him to drink at his passion, to deaden his pains, and produce a stupor. The gall mentioned on the same occasion by St Matthew is probably the same with myrrh; for any thing bitter was usually distinguished by the name of gall. The Hebrews were accustomed to give those who were executed some stupefying draught. The difficulty which arises from the seeming difference between the two evangelists, some have solved by saying that St Matthew, writing in Syriac, made use of the word *marra*, which signifies myrrh, bitterness, or gall; but that the Greek translator has taken it for gall, and St Mark for myrrh. Others think that our Saviour's drink was mingled with myrrh as a stupefying drug, but suppose that the soldiers, out of a wanton cruelty and inhumanity, infused gall; which was the reason, according to them, why, when he had tasted, he refused to drink.

MYRTOUM Mare, a part of the Ægean Sea, lying between Eubœa, Peloponnesus, and Attica. It receives this name from Myrto, a woman; or from Myrtus, a small island in the neighbourhood; or from Myrtilus the son of Mercury, who was drowned therein.

MYRTUS, in *Ancient Geography*, a small island near Carystus, in Eubœa, which gave name to the *Mare Myrtoum*. Strabo extends this sea between Crete, Argia, and Attica. Pausanias, making it commence at Eubœa, joins it at Helena, a desert island, with the Ægean Sea; but Ptolemy carries it to the coast of Caria; and Pliny says that the Cyclades and Sporades are bounded on the west by the Myrtoan coast of Attica.

MYSCHKIN, a circle of the Russian province Jaroslow, between 37. 33. and 38. 46. east longitude, and 57. 25. and 58. 4. north latitude. It contains one city, and 701 villages, distributed into fifty-five parishes. It is watered by the rivers Wolga, Karasitschna, Kadka, and Sudka, and is moderately fertile, maintaining a population of 71,390 persons. The capital, of the same name, is situated on the Wolga, 460 miles from St Petersburg, with some little trade by that river. Long. 56. 5. E. Lat. 57. 47. N.

MYSIA, a country of Asia Minor, generally divided into Major and Minor. Mysia Minor was bounded on the north and west by the Propontis and Bithynia, and on the southern and eastern borders by Phrygia. Mysia Major had Æolia on the south, the Ægean Sea on the west, and Phrygia on the north and east. Its chief cities were Cyzicum and Lampsacus. The inhabitants were once very warlike; but they greatly degenerated, and the words *Mysorum ultimus* were emphatically used to signify a person of no merit. The ancients generally hired them to attend their funerals as mourners, because they were naturally melancholy and inclined to shed tears. They were once governed by monarchs. They are supposed to be descended from the Mysians of Europe, a nation who inhabited that part of Thrace which was situated between Mount Hæmus and the Danube.

Mysleniczer || Mysore.

MYSLENICZER, a circle of the Austrian province of Gallicia, extending over 825 square miles, and comprehending twelve cities and towns, and 339 villages, with 37,145 houses, and 144,077 inhabitants. The capital is a city of the same name, situated on the river Raba, with 286 houses, and 2075 inhabitants.

MYSOL Isle. This island is situated in the Eastern Seas, about the second degree of south latitude, midway between the large islands of Ceram and Papua. It is fifty miles in length by fifteen in breadth, and is inhabited on the sea coast chiefly by Mahommedans, and in the interior by the natives. On the east coast is a harbour, formed by a small island, on which fresh water may be procured in abundance without risk, as the harbour is landlocked. The island is frequented by birds of paradise in great flocks at certain seasons of the year, when they are caught with bird-lime, and afterwards dried with the feathers on as they are seen in Europe. The black loory, a very scarce bird, may also be purchased here. The trade is inconsiderable, consisting chiefly of biche de mer, ambergris, pearls, and stones; the imports are coarse piece goods, cutlery, beads, iron in bars, china ware, looking-glasses, and brass-wire.

MYSON, a native of Sparta, one of the seven wise men of Greece. When Anacharsis consulted the oracle of Apollo, to know which was the wisest man in Greece, he received for answer, he who is now ploughing his fields. This was Myson.

MYSORE, Mahesura, or Maisoor, a large province in the south of India, situated principally between the eleventh and fifteenth degrees of north latitude, and now surrounded by the British territories subject to the Madras presidency. Its length is estimated at 210 miles, and its average breadth at 140. The country consists of a high table land, enclosed between the Eastern and the Western Ghauts, and elevated 3000 feet above the level of the sea, from which rise numerous lofty hills, containing the sources of many rivers, such as the Cavery, Toombuddra, Vedawati, Bhadri, Penar, and others. The elevation of this inland plain varies at different places. The highest mountain of Mysore, namely, Sivagunga, is 4600 feet; at the Pass of Peddanaik Durgum, the height is 1907 feet, according to barometrical observations; at Baitamangalum, 2435; at Bangalore, 2807; at Hurrypur, 1831. The heat of the climate is mitigated by the height of the ground, and the climate throughout the whole of this extensive tract is remarkably temperate and healthy. This country has another peculiar advantage, namely, that it is sheltered by the Ghaut Mountains from the violence of the monsoons, which sweep along the lower plains, and deluge with torrents of rain the coasts of Coromandel and Malabar. The clouds which are driven on the land from the Indian Ocean by the south-west monsoon are opposed by the mountain wall of the Western Ghauts; and although the higher and lighter clouds make their way into the plains, and occasion frequent, and sometimes heavy showers, which refresh the air and the ground, yet they are seldom of long continuance. Occasional showers, however, fall at other seasons, and preserve the verdure of the fields throughout the year.

The country of Mysore, from its elevation and its temperate climate, not only produces all the other grains and vegetables of other parts of India, but also many of the fruits of Europe. It appears to have been formerly in a much higher state of cultivation than at present; but has been

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ruined partly by the invasion of armies, partly by the rigorous administration of Hyder, and still more by that of his son Tippoo. It is now rapidly recovering from its depopulation, under the sway of the British. Rice is cultivated on the higher and lower grounds; and the cultivation is much aided by means of reservoirs and wells, whence the farmers irrigate their fields and gardens. The soil also produces the sugar-cane, for which the black clayey lands are best adapted. The crop of raggy, a species of coarse grain which supplies all the lower classes with their common food, is the most important of any raised on the dry field. Wheat is cultivated in gardens, or in the rich soil of the beds of the tanks, which have been exhausted for the purposes of irrigation. It is only a small quantity, however, that is raised. The palma christi is found here, and produces abundance of castor oil, which is used for the lamp and a variety of other purposes. The betel-leaf tree thrives on the low grounds, where it can obtain a supply of water; and the poppy is cultivated, both for making opium and on account of the seed, which is much used in the sweet cakes that are eaten by the higher ranks of the natives. The cocoa-nut palm begins to produce in this province when it is seven or eight years old. Agriculture is here in a very backward state, and the implements used are very imperfect. The plough has neither coulter nor mould-board to divide and turn over the soil, and it seldom penetrates more than three inches deep. The fields are in consequence very imperfectly cleared; and, after six or eight ploughings in all directions, numerous small bushes remain as erect as before the labour commenced. Considerable attention is however paid to the manuring of the soil; every farmer collecting a heap from the dung and litter of his cattle, intermixed with the ashes and soil of their houses. The cattle reared are cows, buffaloes, sheep, and the long-legged goat; the native breed of horses here, as in most parts of India, is a small, ill-shaped, vicious pony. Above the Ghauts, asses are much used as beasts of burden. The breed is small, and no pains are taken to improve it. Swine were formerly very common in Mysore, but they were banished by Tippoo from the vicinity of the capital. There are three varieties of sheep, red, white, and black. Common salt is found in abundance in many places, and effervesces on the surface during the dry season. Carbonate of soda is also found amongst the Chitteldroog Hills, mixed with common salt. Iron-ore abounds in different parts, though it is worked in a very slovenly manner. At the iron works near Chinnarayana Durga, the smelters procure from the one about forty-seven per cent. of malleable iron, which is however very impure. The principal rivers are the Cavery, the Toombuddra, the Vedawati, the Bhadri, the Arkanati, the Penar, Palar, and Panaur. These rivers are, however, all inconsiderable, with the exception of the Cavery, as long as they continue within the limits of this province. There are many large tanks and reservoirs in the higher grounds throughout Mysore, but there are no lakes. The water in these tanks is always sweet, and preferred on this account to that of wells, which is very frequently brackish. This province is divided into three districts, namely, the Patana (or Seringapatam), the Nagara (or Bednore), and the Chatracal (or Chitteldroog) districts. The chief towns are, Seringapatam, Bangalore, Bednore, Chitteldroog, and Sera. Each district is managed by an amildar, who is an officer of justice, police, and revenue, and who is accountable for his conduct to the ministers of the rajah, the latter being kept to their duty by the presence of the British resident. These amildars have under them a number of accountants, in order to manage with accuracy the revenue accounts.

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The present rajah of Mysore, who was raised to the throne after the fall of Tippoo, is the descendant of a pastoral chief, who emigrated, with his tribe and all their flocks and herds, from the province of Gujerat, and were allowed to settle in Mysore. Cham Raj, the representative of this family, took possession of the throne in the year 1507, though he still acknowledged himself the subject of the Maha rajah of Annagoondy, who was a descendant of the ancient Hindu monarchs of Bijanagur. In 1610, one of his successors took possession of the city and fortress of Seringapatam, which may be considered as the beginning of their sovereignty. The crown continued in the same line till about the year 1753, when the decline of this dynasty was followed by its final downfall, and the rise on its ruins of the house of Hyder, of which, and of the subsequent history of Mysore, a full account will be found under the article HINDUSTAN. (B.)

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The gradual introduction of mysteries into religion.

RELIGION, in its original form, was simple and intelligible. It was intended for the instruction and education of all ranks of men, and of consequence its doctrines were on a level with vulgar capacities. The Jewish dispensation was openly practised; nothing was performed in secret; every article was plain, open, and accessible. The divine Author of the Christian economy commanded his disciples to preach his doctrine in the most public manner: "What ye have heard in secret," says he, "preach openly; and what I have taught you in private, teach ye publicly; and proclaim it on the house-tops." Such are the charms of truth, and such the character of that religion which came down from heaven, that they, as it were, "delight, and lift up their voice in the streets, and cry in the chief places of concourse."

But such is the depravity of the nature of man, that the noblest institutions degenerate in his hands. Religion itself, originally pure, simple, and amiable, under his management has often been transformed into pollution, perplexity, and deformity. The ministers of religion, whose province it was to guard the sacred deposit, and to secure it from foreign and spurious intermixtures, have generally been the first innovators, and the first and most industrious agents in corrupting its integrity and tarnishing its beauty. Avarice and ambition prompted that class of men to deviate from the original plainness and simplicity of religious institutions, and to introduce articles, rites, and usages, which might furnish them with opportunities of gratifying these unhallowed and insatiable passions. Hence distinctions unknown to pure and undefiled religion were fabricated, and that heavenly institution, heretofore one, simple, indivisible, was divided into two partitions; the one popular and public; the other dark, secret, and mysterious. The latter of these we intend as the subject of this article.

Etymology of the term, and object of this article.

The English word *mystery* is derived from the Greek μυστηριον; and, in its modern acceptation, imports something above human intelligence, something awfully obscure and enigmatical; any thing artfully made difficult; the secret of any business or profession. The word is often used by the founder of the Christian religion, and more frequently by his apostles, especially St Paul. In these cases, it generally signifies those doctrines of Christianity which the Jews, prior to the advent of the Messiah, either did not or could not understand. The Trinity in Unity and the Unity in Trinity, the incarnation of the Son of God, the union of two natures in one and the same person, &c. we generally call *mysteries*, because they are infinitely above human comprehension. All these significations are out of

Mysteries. the question at present. Our intention in this article is to lay before our readers the fullest and fairest account we have been able to collect, of those ἀπορρήτα, or *secret rites*, of the Pagan superstition, which were carefully concealed from the knowledge of the vulgar, and which are universally known under the denomination of *mysteries*.

The word μυστηριον is evidently deduced from μυστης; but the origin of this last term is not altogether so obvious. The etymologies of it exhibited by the learned are various; some of them absurd and inconsistent, others foolish and futile. Instead of fatiguing our readers with a detail of these, which would be equally unentertaining and uninteresting, we shall only produce one, which to us appears to come nearest the truth. The mysteries under consideration at present were certainly imported into Greece from the East. In those regions, then, we ought of course to look for the etymology of the word. *Mistor* or *mistur*, in Hebrew, signifies "any place or thing hidden or concealed." As this word implies a kind of definition of the nature of the thing intended, and as it is one of the excellencies of original languages to apply vocables with this propriety, we find ourselves strongly inclined to assign the word *mistur* as the root of the term μυστης, *myster*.

Motives to the introduction of the mysteries.

We have already observed, that the avarice and ambition of the Pagan priesthood probably gave birth to the institution of the mysteries. To this observation we may now add, that the ministers of that superstition might possibly imagine, that some articles of their ritual were too profound to be comprehended by the vulgar; others, too sacred to be communicated to a description of men whom the institutions of civil society had placed in a situation not only subordinate, but even contemptible. It was imagined, that things sacred and venerable would have contracted a taint and pollution by an intercourse with sordid and untutored souls. These appear to us the most probable motives for making that odious and pernicious distinction between the popular religion and that contained in the sacred and mysterious ritual.

Hypothesis of Warburton.

Bishop Warburton[1] is positive that the mysteries of the Pagan religion were the invention of legislators and other great personages, whom fortune or their own merit had placed at the head of those civil societies which were formed in the earliest ages in different parts of the world. It is with reluctance, and indeed with diffidence, that we presume to differ in our sentiments from such respectable authority. Whatever hypothesis this prelate had once adopted, so extensive was his reading, and so exuberant his intellectual resources, that he found little difficulty in defending it by an appearance of plausibility, if not of rational argumentation. The large quotations he has adduced from Plato and Cicero do indeed prove that the sages and legislators of antiquity sometimes availed themselves of the influence derived from the doctrines of the mysteries, and from the authority they acquired by the opinion of their having been initiated in them; but that those men were the inventors and fabricators of them, is a position for which his quotations do not furnish the most slender presumption. At the same time we think it not altogether certain that the doctrine of a divine Providence, and a future state of rewards and punishments, were revealed in the mysteries with all the clearness and cogency which is pretended by his lordship.

But, granting that the fabric was raised by the hands of sages and legislators, we imagine it would be rather difficult to discover what emolument that description of men could propose to derive from the enterprise. The institution was evidently, and indeed confessedly, devised to conceal from the million those very doctrines and maxims which, had they known and embraced them, would have contributed most effectually to dispose them to submit to those wise regulations which their governors and legislators wished most ardently to establish. Experience has taught that nothing has a more commanding influence on the minds of the vulgar than those very dogmas which, according to the bishop, were communicated to the initiated. A conviction of the unity of the deity, of his wisdom, power, goodness, omnipresence, &c. the steady belief of the immortality of the human soul, and of a future state of rewards and punishments, have in all ages and in all countries proved the firmest supports of legal authority. The very same doctrines, in the dawn of Christianity, contributed, of all other methods, the most effectually to tame and civilize the savage inhabitants of the northern regions of Europe.[2] Supposing those principles to have been inculcated by the mysteries, the most prudent plan legislators could have adopted would have been to publish them to all mankind. They ought to have sent forth apostles to preach them to the savages whom they had undertaken to civilize. According to the learned prelate, they pursued the opposite course, and deprived themselves of those very arms by which they might have encountered and overthrown all the armies of savagism. Mysteries.

Mysteries of Eleusis said to be revealed publicly in Crete.

Of all the legislators of antiquity, the Cretan alone was prudent enough to foresee and adopt this rational plan. Diodorus the Sicilian informs us that the mysteries of Eleusis, Samothracia, and other places, which were elsewhere buried in profound darkness, were amongst the Cretans taught publicly, and communicated to all the world. Minos, however, was a successful legislator, and his intercourse with Jupiter Idæus extended his influence and established his authority. He was not under the necessity of calling in the mysteries to his assistance: on the contrary, it is highly probable that the universal knowledge of the doctrines of the mysteries among his countrymen contributed in a considerable degree to facilitate his labour and ensure his success.

The divine Author of the Christian economy, viewed in the light of a human legislator, saw the propriety of this procedure. Nothing was concealed in his institutions; nothing was veiled with mystery, or buried in darkness. The success was answerable to the wisdom of the plan. The million flocked to the evangelical standard; the gospel was preached to the poor, to the illiterate, and the vulgar; and the meanest of mankind eagerly embraced its maxims. Wherever it prevailed it produced civilization, morality, sobriety, loyalty, and every other private and social virtue. Upon the supposition that the mysteries had contained and inculcated the principles and practices which the prelate supposes they did, the civilizers of mankind, legislators, magistrates, and princes, ought to have combined to make them public for the sake of their own tranquillity, and the more effectual support of their authority and influence.

Mysteries the offspring of Egyptian priestcraft, but adopted by legislators, &c.

Upon the whole, we are inclined to believe that the mysteries were the offspring of Egyptian priestcraft. They were instituted with a view to aggrandize that order of men, to extend their influence, and enlarge their revenues. To accomplish these selfish projects, they applied every engine towards besotting the multitude with superstition and enthusiasm. They taught them to believe that themselves were the distinguished favourites of heaven; and that celestial doctrines had been revealed to them, too holy to be communicated to the profane rabble, and too sublime to be comprehended by vulgar capacities. It is,

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[1] Divine Legation of Moses Demonstrated.

[2] The Germans, Russians, and Scandinavians, who were never thoroughly civilized till the gospel was preached among them.

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we confess, exceedingly probable, that after the mysteries were instituted, and had acquired an exalted reputation in the world, legislators, magistrates, judges, and potentates, joined in the imposture, with the same views and from the same principles. Princes and legislators, who found their advantage in overawing and humbling the multitude, readily adopted a plan which they found so artfully fabricated to answer these very purposes. They had interest enough with the sacerdotal mystagogues,[1] to induce them to allow them to participate in those venerable rites which had already established the authority of that description of men in whose hands they were deposited. The views of both parties were exactly congenial. The respect, the admiration, and dependence on the million, were the ultimate objects of their ambition respectively. Priests and princes were actuated by the very same spirit. The combination was advantageous, and of consequence harmonious. For these reasons we have taken the liberty of differing from his lordship of Gloucester with respect to the persons who first instituted the secret mysteries of the Pagan religion.

Hypothesis of Mosheim singular and indefensible.

Another writer of considerable reputation in the republic of letters is of opinion that the mysteries were entirely commemorative; that they were instituted with a view to preserve the remembrance of heroes and great men, who had been deified in consideration of their martial exploits, useful inventions, public virtues, and especially in consequence of the benefits by them conferred on their contemporaries. According to him,[2] the mysteries of Mithras were established for this very purpose. It would be no difficult matter to prove that the Persian deity of that name was the sun, and that his name and insignia jointly ascertain the truth of this assertion. The same writer extends this observation to the mysteries of the Egyptians, Phœnicians, Greeks, Hetruscans, and, in a word, to all the institutions of that species throughout the world. In opposition to this singular opinion, it may be argued, we think with some show of reason, that the method of preserving the memory of great and illustrious men generally adopted, was the establishing festivals, celebrating games, offering sacrifices, singing hymns, dances, &c. We can recollect no secret mysteries instituted for that purpose, at least in their original intention. If any usage of the commemorative kind was admitted, it was superinduced at some period posterior to the primary institution. At the same time, upon the supposition that the orgia of Bacchus were the same with those of the Egyptian Osiris, and that the mysteries of Ceres exhibited at Eleusis were copied from those of the Egyptian Isis, and allowing that the former was the sun, and the latter the moon, it will be difficult to find out the human persons whose exploits, adventures, inventions, &c. were intended to be immortalized by those institutions. Upon the whole, the mysteries were performed in secret; they were intended to be communicated only to a few; of course, had they been instituted with a view to immortalize the memory of heroes and great men, the authors would have acted the most foolish and inconsistent part imaginable. Instead of transmitting the fame of their heroes with eclat to posterity, they would by this procedure have consigned it to eternal oblivion.

We must then recur to our first position. The mysteries were the offspring of bigotry and priestcraft; they originated in Egypt, the native land of idolatry. In that country the priesthood ruled predominant. The kings were engrafted into their body before they could ascend the throne. They were possessed of a third part of all the land of Egypt.[3] The sacerdotal function was confined to one tribe, and was transmitted unalienably from father to son. All the orientals, but more especially the Egyptians, delighted in mysterious and allegorical doctrines. Every maxim of morality, every tenet of theology, every dogma of philosophy, was wrapt up in a veil of allegory and mysticism. This propensity no doubt conspired with avarice and ambition to dispose them to a dark and mysterious system of religion. Besides, the Egyptians were a gloomy race of men;[4] they delighted in darkness and solitude. Their sacred rites were generally celebrated with melancholy airs, weeping, and lamentation. This gloomy and unsocial bias of mind must have stimulated them to a congenial mode of worship. In Egypt, then, we are to search for the origin of the mysteries. Both the nature of the institution and the genius of the people confirm this position; and historians, both ancient and modern, are agreed in admitting the certainty of the fact.

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The Osiris and Isis of Egypt the Bacchus and Ceres of Greece.

The Osiris of Egypt, every body knows, was the original Bacchus, as the Isis of the same country was the Ceres of the Greeks. The rites of Osiris were performed with loud shrieks and lamentations when he was put into the coffin, and with the most extravagant mirth when he was in a manner raised from the dead, or supposed to be found again. Their hymns were, upon the whole, always composed in melancholy, affecting strains, and consisted of lamentations for the loss of Osiris, the mystic flight of Bacchus, the wanderings of Isis, and the sufferings of the gods.[5] The Canaanites, who were a kindred tribe of the Mizraim or Egyptians, imitated them in their sacred rites. At Byblus, Berytus, Sidon, and afterwards at Tyre, they used particularly mournful dirges for the death of Adonis or Tammuz, who was the same with the Egyptian Osiris, *i. e.* the sun.[6]

Death of Osiris, and wanderings of Isis.

The Egyptians, then, naturally inclined to gloom and secrecy, instituted a mode of worship congenial with their natural disposition of mind. The recess of the sun towards the southern hemisphere was the death[7] of Osiris; the wanderings of Isis in search of her husband and brother, allegorically imported the longing of the earth[8] for the return of the fructifying influence of the solar heat.

When that luminary returned towards the summer solstice, and grain, trees, fruits, herbs, and flowers adorned the face of nature, another festival was celebrated of a very different complexion from that of the former. In this season all Egypt was dissolved in the most extravagant mirth and jollity. During the celebration of those festivals, the priests formed allegorical representations of the sun and the earth.[9] They personified the one and the other, and allegorized their motions, aspects, relations, sympathies, accesses, recesses, &c. into real adventures, peregrinations, sufferings, contests, battles, victories, defeats, and so forth. These, in process of time, were held up to the vulgar as real occurrences; and these in a few ages became the most essential articles of the popular creed. From this source were derived the conquests of Dionysius or Bacchus, so beautifully exhibited by Nonnus in his Dionysiacs; the wanderings of Io, wonderfully

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[1] The mystagogues were the ministers who acted the chief part in celebrating the mysteries.

[2] Principio hoc ego quidem controversia vacare, arbitror, mysteria quæ vocantur, ritus fuisse idcirco institutos ne memoria periret veterum beneficiorum, inventorum, fatorum, rerum gestarum quibus primi populorum conditores, aut alii præclari homines, decus nomen, et famam, inter suos sibi comparaverant. Neque hæc cuiquam sententia mirabilis videri poterit. (Cud. *Syst. Intellect.* ed. Moshemii, p. 329.)

[3] Diodorus Siculus, lib. i.

[4] Plutarch.

[5] Plutarch. *de Iside et Osiride.*

[6] Ezek. chap. viii.; and Nonni *Dionys.*

[7] Macrob. *Saturnalia.*

[8] Plutarch. *de Iside et Osiride.*

[9] Isis, among the Egyptians, sometimes signifies the moon, and sometimes the earth.

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adorned by Æschylus; and the labours of Hercules, afterwards usurped by the Greeks.

The Egyptians deified departed heroes.

Whether the Egyptians deified mortal men in the earliest ages, has been much controverted. Jablonski[1] has taken much pains to prove the negative. Diodorus[2] assures us that they paid their monarchs a kind of divine adoration, even in their lifetime. Plutarch tells us plainly,[3] that some were of opinion that Isis, Osiris, Horus, Anubis, and Typhon, were once mortal persons, who were exalted into demons after their death. The Sicilian, in his history of Isis and Osiris, Pan, Hermes, &c. plainly represents them as human personages; and informs us, that the Egyptians imagined that after their decease they transmigrated into particular stars. From these authorities, we are inclined to believe that the Egyptians, as well as the other Pagans, did actually deify persons who had distinguished themselves in their days of nature by prowess, wisdom, useful arts and inventions. This was a constant practice among the Greeks, who probably learned it from the people in question.

Secrets respecting the objects of worship revealed in the mysteries.

The exploits of these heroes had been disguised by allegorical traditions and hieroglyphical representations. They had been magnified beyond all dimensions, in order to astonish and intimidate the vulgar. They had been interlarded with the most extravagant fables, in order to gratify their propensity towards the marvellous. All these secrets were developed in the mysteries. The catechumens[4] were informed of every particular relating to the birth, the life, the exploits, the adventures, the misfortunes, and decease of those heroic personages, and when, and by what means, they had attained to the high rank of divinities. At the same time we think it highly probable that those demigods were represented in their state of exaltation and heavenly splendour. The magicians of Egypt were abundantly qualified for exhibiting *angels in machines*. The souls of virtuous men who had not been eminent enough to merit the honour of deification, were shown in all the perfection of Elysian felicity; and perhaps the souls of tyrants, and of the children of Typhon,[5] were shown in Tartarus, suffering all the extremes of infernal punishment. From these exhibitions the mystagogues might naturally enough take occasion to read their pupils suitable lectures on the happy tendency of a virtuous conduct, and the dishonour and misery consequent upon a contrary course. They might set before them immortal renown, deification, and Elysium, on the one hand, and eternal infamy and misery on the other. This will probably be deemed the chief advantage accruing from this institution.

Besides the communications above mentioned, the catechumens were taught many secrets of physiology, or the nature of the phenomena of the world. This Pharnutus[6] everywhere affirms, especially in his last book, towards the end. Plutarch, too, informs us that many of the Greek philosophers were of opinion that most of the Egyptian fables were allegorical details of physical operations. Eusebius acquaints us,[7] that the physiology, not only of the Greeks, but likewise of the barbarians, was nothing else but a kind of science of nature, a concealed and dark theology, involved in fable and fiction, whose hidden mysteries were so veiled over with enigmas and allegories, that the ignorant million were as little capable of comprehending what was said as what was suppressed in silence. This, says he, is apparent from the poems of Orpheus, and the fable of the Phrygians and Egyptians. Dionysius of Halicarnassus likewise observes,[8] that the fables of the Greeks detail the operations of nature by allegories. Proclus[9] makes the same observation concerning the people in question. The Egyptians, says he, taught the latent operations of nature by fables.

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Physiological secrets expounded in the mysteries of Egypt.

These physiological secrets were no doubt expounded to the initiated; and that the Egyptian priests were deeply skilled in physiological science, can scarcely be questioned, if we believe that Jannes and Jambres rivalled Moses with their enchantments. The preceding detail comprehends all that was revealed to the Epoptæ in the original Egyptian mysteries. What articles might have been introduced afterwards we cannot pretend to determine.

Be that as it may, one thing is certain, namely, that the vulgar were excluded from all those choice secrets, which were carefully reserved for the nobility and sacerdotal tribes. To them it was given to know the mysteries of the kingdom of darkness; but to those who were without, all was mystery and parable. While the laity fed on husks, the clergy and the quality feasted on royal dainties. The priests who had devised these allegories understood their original import, and bequeathed it as an inestimable legacy to their children. Here then we have the primary object of the mysteries, namely, to develope to the initiated the original and rational import of those allegorical and mystical doctrines which were tendered to the uninitiated, wrapt up in impenetrable allegory and obscurity. To the former these were communicated and explained; the latter were obliged to stand at an awful distance, and retire as the *Procul, O procul, este profani*, thundered in their ears.

These allegorical traditions appear to have originated in Egypt (see MYTHOLOGY). It was the general bias of the oriental genius. The Egyptians, however, according to the most authentic accounts,[10] were the greatest proficients in that science. The original subjects of these institutions were, we imagine, the articles we have specified above: but in process of time, according to the natural course of things, numerous improvements were made, and many new rites, ceremonies, usages, and even doctrines, were superinduced, which were utterly unknown to the original hierophants.[11] Simplicity is, for the most part, one of the distinguishing characters of a new institution; but succeeding architects generally imagine that something is still wanting to complete the beauty, the regularity, the uniformity, the magnificence, and perhaps the conveniency, of the structure. Hence, at length, it comes to be so overloaded with adventitious drapery, that its primary elegance and symmetry are altogether defaced. This was the case with the earliest Egyptian mysteries. Their subject was at first simple and easy to be comprehended; in time it became complex, intricate, and unintelligible.

Temples where the mysteries were celebrated.

In order to celebrate those mysteries with the greater secrecy, their temples were so constructed as to favour the artifice of the priests. The fanes, in which they used to execute their sacred functions, and to perform the rites and ceremonies of their religion, were subterraneous apartments, constructed with such wonderful skill and dexterity, that every thing that appeared in them breathed an air of solemn secrecy. Their walls were covered with hieroglyphic paintings and sculpture, and the altar was situated

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[1] *Pantheon Egyptiorum.* [2] Lib. i. [3] *De Iside et Osiride.*

[4] Catechumens were pupils who were learning the elements of any science.

[5] Typhon was the evil genius, or devil, of the Egyptians.

[6] *De Nat. Deorum.* [7] *Præparatio Evangelii.* [8] *Antiquit. Roman.* [9] *In Timæo.*

[10] As early as the age of Joseph, the Egyptians were skilled in the interpretations of dreams, divinations, &c., and in the age of Moses they were become wise men, magicians, &c.

[11] Hierophant imports a priest employed in explaining the doctrines, rites, &c. communicated to the initiated.

Mysteries. in the centre of the apartment. Modern travellers[1] have of late years discovered some vestiges of them, and bear witness to the above description of those dark abodes.[2] In those subterraneous mansions, which the priests of that ingenious nation had planned with the most consummate skill, the kings, princes, and great men of the state encountered the dangers and hardships contrived to prove their prudence, fortitude, patience, abstinence, &c. These were appointed to try their merit; and by these the hierophants were enabled to decide whether or not they were duly qualified for receiving that benefit. Upon these occasions, we may believe, abundance of those magical tricks were exhibited, for which the magicians of Egypt were so much celebrated among the ancients. The strange and astonishing sights, the alternate successions of light and darkness, the hideous spectres exposed to view, the frightful howlings re-echoed by these infernal domes, the scenes of Tartarus and Elysium, exhibited alternately and in quick succession, must have made a deep and lasting impression on the mind of the affrighted votary.[3] These scenes we shall describe more fully in the sequel.

The Grecian infernal regions copied from the Egyptian mysteries.

From the scenes exhibited in celebrating the Egyptian mysteries, especially those of Isis and Osiris, the Greeks seem to have copied their ideas of the infernal regions, and the subterraneous mansions of departed souls. Many colonies of Egyptians settled in Greece. From these the αοιδοι,[4] or most early bards of Greece, learned them imperfectly. Of course, we find Homer's account of the infernal regions, and of the state of departed souls, lame and incoherent. Succeeding bards obtained more full and more distinct information. Euripides and Aristophanes seem to have paved the way for the prince of Roman poets. Plato[5] and some of the other philosophers have shown, by their descriptions or allusions, that the whole apparatus of Tartarus and Elysium had become a hackneyed topic some centuries before Virgil was born. This incomparable poet borrowed his ideas from Homer, Aristophanes, Euripides, Plato, &c. These, under his plastic hand, in the sixth Æneid, grew into a system beautiful, regular, uniform, and consistent. The materials he has employed were created to his hand; he had only to collect, polish, arrange, and connect them. The sentiments collected from the Platonic philosophy, and the inimitable episode copied from the annals of Rome, by the masterly skill which he has displayed in the application of them, form the chief excellencies of the piece. For the rest, he could well dispense with going to Eleusis:[6] every old woman in Athens and Rome could repeat them.

Mysteries brought from Egypt into Persia and Greece.

Egypt was, then, the native land of mysteries as well as of idolatry. Every god and goddess respectively had their mysteries; but as those of Isis and Osiris were the most celebrated, they of course became principal objects of pursuit as well as of imitation to the neighbouring nations. These, as is generally believed, were carried into Persia by Zoroastres, or Zerdusht, by whom they were consecrated to Mithras. On these we shall make some observations in the sequel. Orpheus imported them into Thrace; Cadmus brought them into Bœotia, where they were sacred to Bacchus. Inachus established them at Argos in honour of Juno, the same with Isis;[7] Cyniras in Cyprus, where they were dedicated to Venus. In Phrygia they were sacred to Cybele, the mother of the gods. Mysteries.

Our learned readers, who will probably reflect that the Egyptians were in ancient times inhospitable to strangers, will perhaps be surprised that this fastidious and jealous people were so ready to communicate the arcana of their religion to foreigners. But they will please recollect, that a great part of Greece was planted with colonies from Egypt, Phœnicia, Palestine, &c. This we could easily prove, did the bounds prescribed us admit such a digression. Orpheus, if not an Egyptian, was at least of oriental extraction. Inachus, Cadmus, and Melampus, are universally allowed to have been Egyptians. Erechtheus, in whose reign the Eleusinian mysteries were established, was an Egyptian by birth, or at least sprung from Egyptian ancestors. The Egyptians, then, in those early ages, did not view the Greeks in the light of aliens, but as a people nearly related either to themselves or the Phœnicians, who were their brethren. Upon this connection we imagine it was that in later times most of the sages of Greece, especially of Athens, found so hospitable a reception among that people. They probably viewed them in the light of propagandi; apostles able and willing to disseminate their idolatrous rites. This observation, which might be supported by numberless authorities, did the nature of the present inquiry permit, will, we think, go a great way towards obviating the objection.

Mysteries of Mithras, Bacchus, and Ceres, the most august.

Although, as has been observed, every particular deity had his own peculiar mysterious sacred rites, yet, of all others, those of Mithras, Bacchus,[8] and Ceres, were deemed the most august, and were most universally and most religiously celebrated. To these, therefore, we shall in a good measure confine ourselves upon this occasion. If our readers shall become intimately acquainted with these, they may readily dispense with the knowledge of the rest, which are, indeed, no more than streams and emanations from these sources. We shall, then, in the first place, present to our readers a brief sketch of the mysteries of Mithras.

Account of the mysteries of Mithras.

Mithras, or, according to the Persian, *Mihr*, was one of the great gods of the Asiatics. His worship was for many ages confined to Persia. Afterwards, however, it was propagated so far and wide that some have imagined they had discovered vestiges of it even in Gaul. *Mihr*, according to Dr Hyde,[9] signifies *love*, and likewise the *sun*. If we might presume to differ from so respectable an authority, we should conjecture that it is a cognate of the Hebrew word *muthir*, "excellentia, præstantia." That there was an analogy between the Hebrew and old Persian, is generally admitted by the learned. Be that as it may, Mithras was the sun[10] amongst the Persians; and in honour of that luminary this institution was established. Mithras, according to Plutarch,[11] was the middle god between Oramaz and

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[1] Norden, Shaw, Pococke, &c.

[2] See an excellent description of these subterraneous abodes, and of the process of probation carried on there, in a French romance, of great learning and ability, written by the Abbé Terrasson, entitled the Life of Sethos.

[3] Persons who had descended into Trophonius's vault were said to have been so terrified with shocking sights, that they never laughed during the remainder of their lives.

[4] These were strolling poets, like our minstrels, who frequented the houses of the great men of Greece, and entertained the company upon public occasions with singing and tales of other times.

[5] *Phædo.*

[6] Bishop Warburton has, with much ingenuity, and a vast profusion of reading, endeavoured to prove that Virgil borrowed the whole scenery of the sixth Æneid from the sources mentioned in the text.

[7] Isis was the moon, and the original Juno was the same planet.

[8] Bacchus was the Osiris of the Egyptians, and Ceres was the Isis of the same people.

[9] *Religio Vet. Persarum.*

[10] Mosheim, in his note on Cudworth's Intellectual System, p. 330, has taken much pains to prove that Mithras was a deified mortal; but we cannot agree with that learned man in this point.

[11] Isis and Osiris, p. 369, line 20 from the bottom. This philosopher makes Zoroaster, according to some, 5000 years prior to the Trojan war. This date is certainly extravagant. We cannot, however, agree with some moderns, who make him contemporary with Darius Hystaspes, the immediate successor of Cambyses, because it contradicts all antiquity.

Mysteries. Ariman, the two supreme divinities of Persia. But the fact is, the solar planet was the visible emblem of Oramaz, the good genius of the Persian tribes, and the same with the Osiris of the Egyptians. From these people, some have imagined that Zoroastres,[1] or Zerdusht, borrowed his mysteries of Mithras. To this opinion we cannot give our assent, because the probationary trials to be undergone by the candidates among the former were much more savage and sanguinary than among the latter. Both, however, were instituted in honour of the same deity; and probably the scenes exhibited and the information communicated in both were analogous, a circumstance which perhaps gave birth to the opinion above mentioned.

The grand festival of Mithras was celebrated six days, in the middle of the month of Mihr.[2] Upon these days, it was lawful for the kings of Persia to get drunk and dance. On this festival, we imagine, the candidates for initiation, having duly proved their vocation, were solemnly admitted to the participation of the mysteries.

Zoroastres[3] worshipped Mithras, or the Sun, in a certain natural cave, which he formed into a temple, and fitted up in a manner exactly mathematical. There Mithras was represented as presiding over the lower world, with all the pomp of royal magnificence. In it, too, were seen the symbols of Mithras and of the world, philosophically and mathematically exhibited, to be contemplated and worshipped. This deity was sometimes represented as mounted on a bull, which he is breaking, and which he kills with a sword. On some bas-reliefs still existing, he appears as a young man with his tiara turned upward, after the manner of the Persian kings. He is clothed with a short tunic and breeches, after the Persian fashion. Sometimes he wears a small cloak. By his sides are seen other human figures, with tiaras of the same fashion on their heads, but without cloaks. One of these figures commonly holds in the one hand a torch lifted up; in the other, one turned downward. Sometimes over the cave are seen the chariots of the sun and moon, and divers constellations, such as cancer, scorpio, &c.

Probationary exercises previous to initiation.

In one of these caves the ceremonies of initiation were performed; but before the candidate could be admitted, he was forced to undergo a course of probationary exercises, so numerous and so rigorous that very few had courage and fortitude enough to go through them. He was obliged to live a life of virtue and abstinence for the space of seven years previous to the period of his initiation. Some months before it, he was obliged to submit to a long and austere fast, which continued fifty days. He was to retire several days to a deep and dark dungeon, where he was successively exposed to all the extremes of heat and cold. Meantime he frequently underwent the bastinado, which the priests applied without mercy. Some say this fustigation continued two whole days, and was repeated no less than fifteen times. In the course of these probationary exercises, the candidate was generally reduced to a skeleton; and we are told, that there have been several instances of persons who have perished in the attempt.

Upon the eve of the initiation, the aspirant was obliged to brace on his armour,[4] in order to encounter giants and savage monsters. In those spacious subterraneous mansions a mock hunting was exhibited. The priests and all the subordinate officers of the temple, transformed into lions, tigers, leopards, boars, wolves, and other savage creatures, assailed him with loud howlings, roaring, and yelling, and every instance of ferine fury. In those mock combats, the hero was often in danger of being really worried, and always came off with bruises and wounds. Lampridius informs us, that when the Emperor Commodus was initiated, he actually carried the joke too far, and butchered one of the priests, who attacked him in the figure of a wild beast. The Persians worshipped Mithras or the Sun by a perpetual fire; hence the votary was obliged to undergo a fiery trial; that is, to pass seven times through the sacred fire, and each time to plunge himself into cold water. Some have made these probationary penances amount to eighty; others have thought that they were in all only eight. As we find no good authority for either of these numbers, we think ourselves at liberty to hazard the following conjecture. The number *seven* was deemed sacred over all the East. The Mithriac penances, we imagine, were either seven, or, if they exceeded it, were regulated by seven repetitions of that number. The candidate having undergone all these torturing trials with becoming patience and fortitude, was declared a proper subject for initiation. But before his admission he was obliged to bind himself by the most solemn oath, with horrible imprecations annexed, never to divulge any single article of all that should be communicated to him in the course of his initiation. Mysteries.

Revelations in the mysteries of Mithras.

What *ἀποῤῥητα* or *ineffable secrets* were imparted to the initiated, it is impossible at this distance of time to discover with any tolerable degree of certainty. We may, however, rest assured, that the most authentic tradition concerning the origin of the universe; the nature, attributes, perfections, and operations of Oromasd; the baleful influences of Ariman; and the benign effects of the government of Mithras, were unfolded and inculcated. The secret phenomena of nature, as far as they had been discovered by the Magi, were likewise exhibited; and the application of their effects, to astonish and delude the vulgar, were taught both in theory and practice. The exercise of public and private virtues was warmly recommended; and vice represented in the most odious and frightful colours. Both these injunctions were, we may suppose, enforced by a display of the pleasures of Elysium and the pains of Tartarus, as has been observed above in describing the mysteries of the Egyptians.

Those initiations are mentioned by Lampridius in the life of Commodus, and likewise by Justin[5] and Tertullian,[6] who both flourished in the second century. The last of these two speaks of a kind of baptism, which washed from the souls of the initiated all the stains which they had contracted during the course of their lives prior to their initiation. He at the same time mentions a particular mark which was imprinted upon them,[7] of an offering of bread, and an emblem of the resurrection; which particulars, however, he does not describe in detail. In that offering, which was accompanied with a certain form of prayer, a vessel of water was offered up with the bread. The same father elsewhere informs us, that there was presented to the initiated a crown suspended on the point of a sword; but that they were taught to say, *Mithras is my crown*. By this answer was intimated, that they looked upon the service of that deity as their chief honour and ornament.

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[1] M. Silohwette (Disser. v. p. 17) asserts that Zoroaster was initiated amongst the Egyptians.

[2] The month Mihr began September 30, and ended October 30.

[3] See Dr Hyde *de Rel. Vet. Pers.* p. 16, 17. Mr Bryant's Anal. vol. i. p. 232. Porphyr. *de Antro. Nymph.* p. 254. This philosopher often mentions the cave of Mithras, and always attributes the institution of his rites to Zoroaster.

[4] Jul. Firmicus. [5] *Dial. cum Tryphone.* [6] *De Præscript. adver. Hæret.*

[7] In allusion to this practice of imprinting a sacred mark, probably on the forehead of the initiated, we find the injunction to the angel, Ezek. chap. ix. ver. 4, and the Revelation *passim.*

Mysteries. After the rites of the Teletæ[1] were finished, the pupil was brought out of the cave or temple, and with great solemnity proclaimed a lion of Mithras;[2] a title which imported strength and intrepid courage in the service of the deity. They were now consecrated to the god, and were supposed to be under his immediate protection; an idea which of course animated them to the most daring and dangerous enterprises.

The worship of Mithras was introduced into the Roman empire towards the end of the republic, where it made very rapid progress. When Christianity began to make a figure in the empire, the champions for Paganism thought of proposing to men the worship of this Power of Benevolence, in order to counterbalance or annihilate that worship which the Christians paid to Jesus Christ the true Sun of Righteousness. But this mode was soon abolished, together with the other rites of Paganism. The Persian grandees often affected names compounded with Mithras; hence Mithridates, Mithrobarzanes, &c.; hence, too, the precious stone called *Mithridat*,[3] which by the reflection of the sun sparkled with a variety of colours. There is likewise a certain pearl of many different colours, which they call *Mithras*. It is found among the mountains near the Red Sea; and when exposed to the sun, it sparkles with a variety of dyes. We find likewise a king of Egypt of that name, who reigned at Heliopolis; who being commanded in a dream to erect an obelisk to the solar deity, reared a most prodigious one in the neighbourhood of that city.

Mithras said to have sprung from a rock. The votaries of Mithras pretended that he was sprung from a rock, and that therefore the place where the mysterious ceremonies were communicated to the initiated was always a cave. Many different reasons have been assigned for the origin of this rock-born deity, most of which appear to us unsatisfactory. If our readers will be obliging enough to accept of a simple and obvious conjecture, they may take the following. A rock is the symbol of strength and stability;[4] the dominion of Mithras, in the opinion of his votaries, was as firm as a rock, and as stable as the everlasting hills. If our readers should not admit the probability of this conjecture, we would beg leave to refer them to the learned Mr Bryant's Analysis of Mythology, where they will find this point discussed with deep research and wonderful ingenuity. Whatever may have been the origin of this opinion with relation to the birth of Mithras, it is certain that some reverence to rocks and caves was kept up a long time even after the establishment of Christianity. Hence the prohibition given to some of the proselytes to that religion, that they should no more presume to offer up their prayers *ad petras*, at the rocks.[5]

We shall conclude our account of the mysteries of Mithras, by citing a passage from M. Anquetil, to whom we are so much indebted for what knowledge we have of the Persian theology, and in which the functions of that deity are briefly and comprehensively delineated. "The peculiar functions of Mithras are to fight continually against Ahriman and the impure army of evil genii, whose constant employment is to scatter terror and desolation over the universe; to protect the frame of nature from the demons and their productions. For this purpose he is furnished with a thousand ears and a thousand eyes, and traverses the space between heaven and earth; his hands armed with a club or mace. Mithras gives to the earth light and sun: he traces a course for the waters: he gives to men corn, pastures, and children; to the world virtuous kings and warriors: he maintains harmony upon earth, watches over the law," &c. As the history of Mithras, and the nature of his mysteries, are not generally known, we imagined it would be agreeable to many of our readers to have the most important articles relating to that subject laid before them as it were in detail. Mysteries.

Mysteries of Bacchus or Osiris. We now proceed to the orgia or mysteries of Bacchus, which we shall introduce with a brief history of that deity. The original Dionysius or Bacchus was the Osiris of the Egyptians, which last was the Sun.[6] Whether there was an Egyptian monarch of that name, as Diodorus Siculus affirms,[7] has no manner of connection with the present disquisition. The Greek name of that deity is plainly oriental, being compounded of *di*, "bright," and *nasta* or *nasa*, in the Æolic dialect *nusa*, "a prince." This name was imported from the East by Orpheus, Cadmus, or by whoever else communicated the worship of Osiris to the Greeks. That the Dionysius of the Greeks was the same with the Osiris of the Egyptians, is universally allowed. Herodotus tells us expressly,[8] that *Osiris* is *Dionysius* in the Greek language: Martianus Capellus, quoted above, expresses the very same idea.[9] The original Osiris, then, was the sun; but the Dionysius or Bacchus of the Greeks was the same with the Osiris of the Egyptians; therefore the Bacchus or Dionysius of the Greeks was likewise the same luminary.

The name *Osiris* has much embarrassed critics and etymologists. The learned Jablonski,[10] instead of delineating the character, attributes, operations, adventures, exploits, and peculiar department assigned this deity by his votaries, has spent much of his pains on trying to investigate the etymology of his name. If it be granted, which is highly probable, that the Hebrew and Egyptian tongues are cognate dialects, we should imagine that it is actually the *Chosher* or *Oshir* of the former language, which imports "to make rich, to become rich." Indeed the words *Osiris* and *Isis* were not the vulgar names of the sun and moon amongst the Egyptians, but only epithets importing their qualities. The name of the sun amongst that people was *Phre* or *Phra*, that of the moon *Ioh*, whence the Greek *Io*. The term *Osiris* was applied both to the sun and to the river Nile, both which by their influence contributed respectively to enrich and fertilize the land of Egypt.

Exploits of Osiris. It was a general custom amongst the orientals to denominate their princes and great men from their gods, demigods, and heroes. When the former were advanced to divine honours, they were in process of time confounded with their archetypes. The original divinities were forgotten, and these upstart deities usurped their place and prerogatives. In the earliest periods of the Egyptian monarchy, there appeared two illustrious personages, Osiris

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[1] The mysteries were called *Teletæ*, which imports, "the rites which confer perfection."

[2] Tertull. *adv. Marc.* p. 55. The priests of Mithras were called the lions of Mithras, and his priestesses lionesses, some say hyænas. The other inferior ministers were called eagles, hawks, ravens, &c. and on their festivals they wore masks corresponding to their titles, after the Egyptian manner, where the priests appeared at the ceremonies with masks resembling the heads of lions, apes, dogs, &c. a circumstance which furnishes a presumption that the mysteries of Mithras were of Egyptian original.

[3] Solinus, cap. x.

[4] Our Saviour probably alludes to this emblem, when he talks of building his church on a rock; and adds, that the gates of hell should not prevail against it.

[5] The Caledonian druids seem to have regarded certain stones with a superstitious veneration, in which the Catholics imitated them. There are in several places of Scotland large stones, which the vulgar call *lecre* stones, that is, we imagine, *lecture*.

[6] See Macrob. lib. i. cap. 21, p. 247, bottom; Diogenes Laert. *in proœmio*, par. 10; Martian. Capel. lib. ii.; Jablonski, vol. i. lib. ii. 415, par. 3; Plut. *Isis et Osiris*, passim.

[7] Lib. i. [8] Lib. ii. cap. 144. [9] *Theol. Egypt.* lib. ii. cap. i. [10] *Pantheon. Egypt.*

Mysteries. and Isis. These were the children of Kronus; and being brother and sister, they were joined in matrimony, according to the custom of the Egyptians. As the brother and husband had assumed the name of the *Sun*, so the sister and consort took that of *Isis*, that is, "the woman,"[1] a name which the Egyptians applied both to the moon and to the earth, in consequence of the similarity of their nature, their mutual sympathy, and congenial fecundity. Osiris having left his consort Isis regent of the kingdom, with Hermes as her prime minister, and Hercules as general of her armies, quitted Egypt with a numerous body of troops, attended by companies of fauns,[2] satyrs, singing-women, musicians, &c. and traversed all Asia as far as the Eastern Ocean. He then returned homeward through Upper Asia, Thrace, Pontus, Asia Minor, Syria, and Palestine. Wherever he marched he conferred numberless benefits on the savage inhabitants. He taught the art of cultivating the ground, preserving the fruits of the earth, and distinguishing the wholesome and nutritive from the unwholesome and poisonous. He instructed them in the culture of the vine; and where vines could not be produced, he communicated to them the method of producing a fermented liquor from barley, very little inferior to wine itself. He built many cities in different parts of the globe, planted numerous colonies,[3] and, wherever he directed his course, instituted just and wholesome laws, and established the rites and ceremonies of religion, and left priests and catechists of his train to teach and inculcate the observance of them. In short, he left everywhere lasting monuments of his progress, and at the same time of his generosity and beneficence. Where he found the people docile and submissive, he treated them with kindness and humanity; if any showed themselves obstinate, he compelled them to submit to his institutions by force of arms.

Death of Osiris. At the end of three years, he returned to Egypt, where his brother Typhon, a wicked unnatural monster, had been forming a conspiracy against his life. This traitorous design he soon afterwards accomplished in the following manner: He invited Osiris, with some other persons whom he had gained over, to an entertainment. When the repast was finished, he produced a beautiful coffer, highly finished, and adorned with studs of gold, promising to bestow it on the person whom it should fit best. Osiris was tempted to make the experiment. The conspirators nailed down the cover upon him, and threw the coffer into the river. This coffer, now become the coffin of Osiris, was, they inform us, wafted by the winds and waves to the neighbourhood of Byblus, a city of Phœnicia, where it was cast on shore, and left by the receding waves at the foot of a tamarind tree.

Wanderings of Isis in quest of his body. Isis, in the mean time, disconsolate and forlorn, attended by Anubis, was ransacking every quarter in search of her beloved Osiris. At length being informed by her faithful attendant and guardian, that his body was lodged somewhere in the neighbourhood of Byblus, she repaired to that city. There, they say, she was introduced to the queen, and after a variety of adventures[4] she recovered the corpse of her husband, which, of course, she carried back with her to Egypt; but the mischievous Typhon, ever on the watch, found her on the banks of the Nile, and having robbed her of her charge, cut the body into fourteen parts, and scattered them up and down. Now, once more, according to the fable, Isis set out in quest of those parts, all of which, one only excepted, she discovered, and interred in the place where she had found them; and hence the many tombs of Osiris in that country. These tombs were denominated *taposins* by the natives. Many other fabulous adventures were ascribed to those two personages, which it is not our province to enumerate at present. If our readers should wish to be more minutely informed on this subject, they may have recourse to the account given by Diodorus Siculus, or to the learned Mr Bryant's Analysis of Ancient Mythology, and M. Cour de Gebelin, where they will find matter enough to gratify their curiosity. Mysteries.

The mysteries of Isis and Osiris instituted in commemoration of these adventures. To commemorate those adventures, the mysteries of Isis and Osiris were instituted; and from them both those of Bacchus and Ceres, amongst the Greeks, were derived. Of the Egyptian solemnity we have an exact epitome in one of the fathers of the church, to the following purpose: "Here follows," says he, "an epitome of the mysteries of Isis and Osiris. They deplore annually, with deep lamentations and shaved heads, the catastrophe of Osiris, over a buried statue of that monarch. They beat their breasts, mangle their arms, tear open the scars of their former wounds; that by annual lamentations the catastrophe of his miserable and fatal death may be revived in their minds. When they have practised these things a certain number of days, then they pretend that they have found the remains of his mangled body; and having found them, their sorrows are lulled asleep, and they break out into immoderate joy." What maxims of morality, secrets of physiology, or phenomena of astronomy, were couched under this allegorical process, it is not our business to investigate in this place. We shall only observe, that, in all probability, Osiris and Isis were sovereigns of Egypt at a very early period; that they had conferred many signal benefits on their subjects, who, influenced by a sense of gratitude, paid them divine honours after their decease; that in process of time they were confounded with the sun and the moon; and that their adventures were at length magnified beyond all credibility, interlarded with fables and allegories, and employed in the mysteries as channels to convey a variety of instructions to the initiated.

Transferred to Byblus and Tyre, and thence imported into Bœotia. But be that as it may, it is certain that the very same mode of worship was established at Byblus, and in after ages transferred to Tyre. The Mizraim and Chanaanim were nearly connected by blood, and their religious ceremonies were derived from the very same source. By what medium the worship of Osiris at Abydus and Tyre was connected, we shall leave to others to explain; we shall only observe, that amongst the Phœnicians this deity obtained the names *Adonis* and *Bacchus*. The former is rather an epithet than a name;[5] the latter is evidently an allusion to the weeping and lamentation[6] with which the rites were performed. We find another name of that divinity mentioned in Scripture;[7] but that term is plainly of Egyptian original. We shall now proceed to the mysteries of Osiris as they were celebrated among the Greeks and Thracians, under the name of the *Orgia of Dionysius* or *Bacchus*.[8]

Orpheus, the celebrated Thracian philosopher, had travelled into Egypt in quest of knowledge; and from that country, according to the most authentic accounts, he imported the Bacchanalian rites and institutions. Some have

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[1] Horus Apollo, cap. iii.

[2] Men and women dressed in the habits of those rural deities.

[3] Many have thought this expedition fabulous; but the numberless monuments of Egyptian architecture, sculpture, and statuary, that have been discovered in the East seem to confirm it.

[4] For the conquests and adventures of Osiris and Isis, we must refer our learned readers to Diod. Sic. *Bibl.* l. i. and Plutarch, *Isis et Osiris*, p. 256, et seq. which we have been obliged to abridge, in consequence of the narrow limits prescribed to us.

[5] Adonis is evidently the Hebrew *Adoni*, or *Adonai*, "my lord," and imports the sovereignty of the deity.

[6] Bacchus is derived from the Phœnician word *bahah*, "to weep." This was the name embraced by the Romans.

[7] Ezek. chap. viii. ver. 14. *Tammuz* is the name of one of the months of the Egyptian year.

[8] Diod. Sicul.; Vossius, *de Idol.*

Mysteries. affirmed that this same Orpheus being intimately acquainted with the family of Cadmus, communicated these rites to them, and endeavoured to transfer them to the grandson of that hero, which grandson became afterwards the Grecian Bacchus. It is, however, we think, much more probable that those rites were imported from Egypt or Phœnicia by Cadmus himself,[1] who was a native of the former country, and is thought to have spent some time in the latter before he emigrated in quest of a settlement in Bœotia. It is said that Semele, the daughter of Cadmus, and the mother of the Grecian Bacchus, was struck with lightning at the very instant of his birth. The child was, in all probability, denominated *Bacchus*,[2] from the sorrow and lamentation this melancholy accident had occasioned in the family. Cadmus, in order to conceal the dishonour of his daughter, might, we imagine, convey away his infant grandson to some of his relations in Phœnicia or Egypt. There he was educated and instructed in all the mysteries of Isis and Osiris, and at the same time initiated in all the magical or juggling tricks of the Egyptian priests and hierophants. Thus accomplished, when he arrived at manhood, he returned to Thebes with the traditional retinue of the original deity of the same name, and claimed divine honours accordingly. This claim, however, was not admitted without much opposition; Pentheus, another grandson of Cadmus, was torn to pieces by the frantic Bacchanalians upon Mount Cithæron, because he attempted to interrupt them in celebrating the orgia. Some have thought that Cadmus lost his kingdom for the same reason; but this, we think, is by no means probable; we should rather imagine that the old prince was privy to the whole process, and that it was originally planned by him, with a view to attract the veneration of his new subjects, by making them believe that there was a divinity in his family.

The actions of Osiris attributed to the Grecian Bacchus.

But however that may be, the vain-glorious Greeks attributed all the actions of the Egyptian hero to their new Bacchus; and, according to their laudable practice, engaged him in numberless adventures in which his prototype had no share. Most of those are futile and unentertaining.[3] The Greeks commonly adopted some oriental personage as the hero of their mythological rhapsodies. Him they naturalized and adopted into some Grecian family, and so he became their own. To him they ascribed all the adventures and exploits of the oriental archetype from whom he was copied. Consequently in the orgia,[4] every thing was collected that had been imported from the East relating to Osiris; and to that farrago was joined all that the Grecian rhapsodists had thought fit to invent, in order to amuse the credulous multitude. This, however, was not the whole of the misfortune. The adventures of Osiris were described by the Egyptian hierophants, veiled with allegorical and hieroglyphical mysteries. These the persons who imported them into Greece did not thoroughly comprehend, or, if they did, they were not inclined to communicate them sound and unsophisticated. Besides, many oriental terms were retained, the import of which was in process of time lost or distorted. Hence the religious ceremonies of the Greeks became a medley of inconsistencies. The mysteries of Bacchus, in particular, were deeply tinctured with this meretricious colouring; the adventures of the Theban pretender were grafted upon those of the Egyptian archetype, and out of this combination was formed a tissue of adventures disgraceful to human nature, absurd, and inconsistent. Indeed the younger or Theban Bacchus seems to have been a monster of debauchery; whereas the Egyptian is represented as a person of an opposite character. Of course the mysteries of the former were attended with the most shocking abominations. Mysteries.

Mysteries of Bacchus spread into Greece.

These mysteries, as has been observed above, were first celebrated at Thebes, the capital of Bœotia, under the auspices of the family of Cadmus. From this country they gradually found their way into Greece, and all the neighbouring parts of Europe. They were celebrated once every three years,[5] because at the end of three years Osiris returned from his Indian expedition. As the Greeks had impudently transferred the actions of the Egyptian hero to their upstart divinity, the same period of time was observed for the celebration of those rites in Greece that had been ordained for the same purpose in Egypt.

Process of their celebration.

When the day appointed for the celebration of the orgia[6] approached, the priests issued a proclamation, enjoining all the initiated to equip themselves according to the ritual, and attend the procession on the day appointed. The votaries were to dress themselves in coats of deerskins, to loose the fillets of their hair, to cover their legs with the same stuff as their coats, and to arm themselves with thyrsi, which were a kind of spears wholly of wood entwined with leaves and twigs of the vine or ivy. It is said that the Bacchanalians, especially the Thracians, used often to quarrel and commit murder in their drunken revels, and that in order to prevent those unlucky accidents, a law was enacted, that the votaries, instead of real spears, should arm themselves with these sham weapons, which were comparatively inoffensive. The statue of the deity, which was always covered with vine or ivy leaves, was now taken down from its pedestal, and elevated on the shoulders of the priests. The cavalcade then proceeded nearly in the following manner.

First of all, hymns were chanted in honour of Bacchus, who was called the *Power of Dances, Smiles, and Jests;* while at the same time he was deemed equally qualified for the exploits of war and heroism. Horace, in some of his dithyrambic odes, has concisely pointed out the subjects of those Bacchanalian songs. In the collection of hymns fabulously attributed to Orpheus, we find several addressed to this deity,[7] each under a different title, derived from the different appellations of the god. All these names are of oriental original, and might easily be explained, did the bounds prescribed to us admit of etymological disquisitions.

The hymn being finished, the first division of the vota-

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[1] Cadmus and Melampus, who were both Egyptians, introduced the Bacchanalia into Greece. The Egyptian or oriental name of Bacchus was *Dinusi*, that is, "the prince of light." Cadmus had learned the name *Bacchus* from the Phœnicians.

We have omitted the immense farrago of fable relating to the connection between Jupiter and Semele, as of little importance to our readers.

[3] Nonnus, an Egyptian of Pentapolis, has collected all the fabulous adventures of Bacchus, and exhibited them in a beautiful but irregular poem. To this we must refer our learned readers. Of the Dionysiacs we have a most judicious sketch, Gebelin, *Calend.* p. 553, et seq.

[4] The orgia belonged to all the Mydones, but to those of Bacchus in a peculiar manner.

[5] Hence these orgia were called *Triteria*.

[6] According to Clemens Alexandrinus, *Cohort.* page 12, Pott. the word *orgia* is derived from *orge*, which signifies "anger," and originated from the resentment of Ceres against Jupiter, in consequence of a most outrageous insult he had offered her with success. We should rather imagine it derived from the Hebrew word *argoz*, signifying a "chest or coffer," alluding to the casket which contained the secret symbols of the god. The Egyptians or Phœnicians might write and pronounce argoz, *orgoz*, or in some manner nearly resembling *orgia*.

[7] These stand between the 41st and 52d; one to Lenæus, or the presser; one to Libnites, or the winnower; one to Bessareus, or the vintager; one to Sabazius, the god of rest; to Myses, or the Mediator &c.

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ries proceeded carrying a pitcher of wine, with a bunch of the vine. Then followed the he-goat, an animal odious to Bacchus, because he ravages the vines. The chanting the hymns, the sacrificing the he-goat, and the revels, games, and diversions with which the celebration of those rites was attended, gave birth to the dramatic poetry of the Greeks; as the persons habited in the dress of fauns, sylvans, and satyrs,[1] furnished the name of another species of poetry of a coarser and more forbidding aspect.

The mysterious coffer, with its contents. Human sacrifices.

Then appeared the mysterious coffer or basket, containing the secret symbols of the deity. These were the phallus,[2] some grains of sesama, heads of poppies, pomegranates, dry stems, cakes baked of the meal of different kinds of corn, salt, carded wool, rolls of honey, and cheese, a child, a serpent,[3] and a van.[4] Such was the furniture of the sacred coffer carried in the solemn Bacchanalian procession. The inventory given by some of the fathers[5] of the church is somewhat different. They mention the die, the ball, the top, the wheel, the apples, the looking-glass, and the fleece. The articles first mentioned seem to have been of Egyptian original; the last were certainly superinduced by the Greeks, in allusion to his being murdered and torn in pieces when he was a child by the machinations of Juno, who prevailed with the Titans to commit the horrid deed. These last seem to have been memorials of his boyish playthings; for, says Maternus, "the Cretans,[6] in celebrating the rites of the child Bacchus, acted everything that the dying boy either said, or did, or suffered. They likewise," says he, "tore a live bull in pieces with their teeth, in order to commemorate the dismembering of the boy." For our part, we think, that if such a beastly rite was practised, it was done in commemoration of the savage manner of life which had prevailed among men prior to the more humane diet invented and produced by Isis and Osiris. Be that as it may, we learn from Porphyry,[7] that in the island of Chios they used to sacrifice a man to Bacchus, and that they used to mangle and tear him limb from limb. This was no doubt practised in commemoration of the catastrophe mentioned above.

Total contempt of decency.

The orgia of this Pagan god were originally simple enough; but this unsophisticated mode was of no long continuance, for riches soon introduced luxury, which quickly infected even the ceremonies of religion. On the day set apart for this solemnity, men and women crowned with ivy, their hair dishevelled, and their bodies almost naked, ran about the streets, roaring aloud *Evohe*,[8] *Bacche*. In this rout were to be seen people intoxicated at once with wine and enthusiasm, dressed like Satyrs, Fauns, and Sileni, in such scandalous postures and attitudes, with so little regard to modesty and even common decency, that we are persuaded our readers will readily enough forgive our omitting to describe them. Next followed a company mounted upon asses, attended by Fauns, Bacchanals, Thyades, Mimallonides, Naiads, Tityri, &c. who made the adjacent places echo to their frantic shrieks and howlings. After this tumultuous herd were carried the statues of Victory, and altars in form of vine-sets, crowned with ivy, smoking with incense and other aromatics. Then appeared several chariots loaded with thyrsi, arms, garlands, casks, pitchers, and other vases, tripods, and vans. The chariots were followed by young virgins of quality, who carried the baskets and little boxes, which in general contained the mysterious articles above enumerated. These, from their office, were called *cistophoræ*. The phallophori[9] followed them, with the chorus of itophallophori habited like fauns, counterfeiting drunk persons, singing, in honour of Bacchus, songs and catches suited to the occasion. The procession was closed by a troop of Bacchanalians crowned with ivy, interwoven with branches of yew and with serpents.[10] Upon some occasions, at those scandalous festivals, naked women whipped themselves, and tore their skin in a most barbarous manner. The procession terminated on Mount Cithæron, when it set out from Thebes; and in other places, in some distant unfrequented desert, where the votaries practised every species of debauchery with secrecy and impunity. Orpheus saw the degeneracy of those ceremonies, and in endeavouring to reform them he probably lost his life. Pentheus suffered in the like attempt, being torn in pieces by the Bacchanalians on Mount Cithæron, among whom were his own mother and his aunts. The Greeks, who were an airy jovial people, seem to have paid little regard to the plaintive part of the orgia; or rather, we believe, they acted with howling and frantic exclamations, often enhanced by a combination of drunkenness, ecstacy, and enthusiastic fury.

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Doctrines inculcated in the orgia.

What secrets, religious, moral, political, or physical, were communicated to the votaries, it is impossible to determine with any degree of certainty. One thing we may admit, namely, that the doctrines discovered and inculcated in the orgia were originally the very same which the apostles of the sect had imbibed in Egypt and Phœnicia, and of which we have given a brief account near the beginning of this article. It is, however, probable, that the spurious or Theban Bacchus had superadded a great deal of his own invention, which, we may believe, was not altogether so sound and so salutary as the original doctrine. However that may be, the initiated were made to believe that they were to derive wonderful advantages from the participation of those rites, both in this life and that which is to come. Of this, however, we shall talk more at length by and by, in our account of the Eleusinian mysteries.

To detail the etymology of the names of this Pagan deity, the fables relating to his birth, his education, his transformations, his wars, peregrinations, adventures, and the various and multiform rites with which he was worshipped, would swell this article to a most immoderate size. If any of our readers should wish to be more minutely and more accurately acquainted with this subject, we must beg leave to refer them to Diodorus Siculus; Apollodorus, *Bibl.*; Euripides, *Bacchæ*; Aristophanes, *Ranæ*; Nonn. *Dionys.*: and, amongst the moderns, to Ban. *Mythol.*; Voss. *de Orig. Idol.*; M. Fourmont, *Réflexions sur l'Origine des Anciens Peuples*; Mr Bryant's Analysis; and especially to M. Cour de Gebelin, *Calandrier ou Almanach*. That prince

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[1] Dacier, Casaubon, and other French critics, have puzzled and perplexed themselves to little purpose about the origin of this word, without considering that it was coeval to dramatic poetry.

[2] The phallus was highly respected by the Egyptians, and was used as the emblem of the fecundity of the human race.

[3] That reptile was in high veneration among the Egyptians. See Euseb. *Præp. Evang.* lib. i. page 26, Steph. where we have a minute detail of the symbolical properties of that creature, according to Taautos, the great legislator of that people.

[4] Servius in *Georg. I.* Virg. ver. 166. Mystica *vannus* Iaachi. The van, says he, is an emblem of that purifying influence of the mysteries, by which the initiated were cleansed from all their former pollutions, and qualified for commencing a holy course of life.

[5] Clemens Alexandrinus. [6] *De Errore Prof. Gent.* [7] *De Abstinentia.*

[8] Clem. Alexand. *Cohort.* page 11, Pott. derives this word from *Cheveh*, the mother of mankind, who first opened the gate to that and every other error; but we are rather inclined to believe that it comes from the oriental word *Heve*, which signifies a "serpent," which among the Egyptians was sacred to the sun, and was likewise the emblem of life and immortality. It then imported a prayer to Bacchus for life, vigour, health, and every other blessing.

[9] The phallus was the symbol of the fructifying power of Nature. The itophallus was the type of that power in act.

[10] Ovid. *Met.*

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of etymologists, in his account of the festival of Bacchus, has given a most acute and ingenious explication of the names and epithets of that deity. For our part, we have endeavoured to collect and exhibit such as we judged most important, most entertaining, and most instructive, to the less enlightened classes of our readers.

Eleusinian mysteries instituted in honour of Ceres.

We now proceed to the Eleusinian mysteries, which, amongst the ancient Greeks and Romans, were treated with a superior degree of awe and veneration. These were instituted in honour of Ceres, the goddess of corn, who, according to the most authentic accounts, was the Isis of the Egyptians. The mysteries of Osiris and Isis have been hinted at in the preceding part of this article. They were originally instituted in honour of the sun and moon, and afterwards consecrated to an Egyptian prince and princess, who, in consequence of their merits, had been deified by that people. We know of no more exact and brilliant description of the ceremonies of that goddess, in the most polished ages of the Egyptian superstition, than what we meet with in the witty and florid Apuleius,[1] to which we must take the liberty to refer our more curious readers. Our business at present shall be to try to investigate by what means, and upon what occasion, those mysteries were introduced into Attica, and established at Eleusis. A passage from Diodorus Siculus,[2] which we shall here translate, will, we think, throw no inconsiderable light on that abstruse part of the subject.

Occasion on which they were introduced into Attica.

"In like manner with him (Cecrops), says that judicious historian, they tell us, that Erechtheus, a prince of Egyptian extraction, once reigned at Athens. Of this fact they produce the following evidence. A scorching drought, during the reign of this prince, prevailed over almost all the habitable world except Egypt, which, in consequence of the humidity of its soil, was not affected by that calamity. The fruits of the earth were burnt up, and at the same time multitudes of people perished by famine. Erechtheus upon this occasion, as he was connected with Egypt, imported a vast quantity of grain from that country to Athens. The people, who had been relieved by his munificence, unanimously elected him king. Being invested with the government, he taught his subjects the mysteries of Ceres at Eleusis, and the mode of celebrating the sacred ceremonies, having transferred from Egypt the ritual for that purpose. In those times the goddess is said to have made her appearance at Athens three several times; because, according to tradition, the fruits of the earth which bear her name were then imported into Attica. On this account the seeds and fruits of the earth were said to be the invention of that deity. Now the Athenians themselves acknowledge, that, in the reign of Erechtheus, the fruits of the earth having perished for want of rain, the arrival of Ceres in their country did actually happen, and that along with her the blessing of corn was restored to the earth. They tell us at the same time, that the Teletæ and the mysteries of that goddess were then received and instituted at Eleusis."

Here then we have the whole mystery of the arrival of Ceres in Attica, and the institution of her mysteries at Eleusis, unveiled. The whole is evidently an oriental allegory. The fruits of the earth had been destroyed by a long course of drought. Egypt, by its peculiar situation, had been preserved from that dreadful calamity. Erechtheus, in consequence of his relation to the Egyptians, imported from their country a quantity of grain, not only sufficient for the consumption of his own subjects, but also a great overplus to export to other parts of Greece, Sicily, Italy, and Spain. Triptolemus, another Egyptian, was appointed by Erechtheus to export this superfluous store. That hero, according to Pherecydes, was the son of Oceanus and Tellus, that is, of the sea and the earth; because his parents were not known, and because he came to Eleusis by sea. The ship in which he sailed, when he distributed his corn to the western parts of the world, was decorated with the figure of a winged dragon; therefore, in the allegorical style of his country, he was said to be wafted through the air in a chariot drawn by dragons. Those creatures, every body knows, were held sacred by the Egyptians.

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Wherever Triptolemus disposed of his corn, thither were extended the wanderings of Ceres. In order to elucidate this point, we must observe, that along with the grain imported from Egypt, Erechtheus, or Triptolemus, or both, transported into Attica a cargo of priests and priestesses from the temples of Busiris, a city which lay in the centre of the Delta,[3] where the goddess Isis had a number of chapels erected for her worship. The presidents of these ceremonies, like all other bigots, gladly laid hold on this opportunity of propagating their religious rites, and disseminating the worship of the deities of their country. That the Egyptian priests were zealous in propagating the dogmas of their superstition, is abundantly evident from the extensive spreading of their rites and ceremonies over almost all Asia and a considerable part of Europe. The Greek and Roman idolatry is known to have originated from them; and numberless monuments of their impious worship are still extant in Persia,[4] India, Japan, Tartary, &c. Our inference then is, that the worship of Isis was introduced into every country where Triptolemus sold or disposed of his commodities. Hence the wanderings of Ceres in search of her daughter Proserpine, who is generally called *Coré*. The famine occasioned by the drought destroying the fruits of the ground imports the loss of Proserpine. The restoration of the corn in various parts of the earth, by fresh supplies from Egypt from time to time, imports the wanderings of Ceres in quest of Proserpine. The whole process is an oriental allegory. The disappearing of the fruits of the earth, of which Proserpine, or Persephone,[5] or Peresephone,[6] is the emblem, is the allegorical rape of that goddess. She was seized and carried off by Pluto, sovereign of the infernal regions. The seed committed to the earth in that dry season appeared no more, and was consequently said to dwell under ground with Pluto. It was then that Ceres, that is, corn imported from Egypt, set out in quest of her daughter. Again, when the earth recovered her pristine fertility, the Coré, or maid, was found by her mother Ceres, that is, the earth; for Isis, among the Egyptians, frequently signified the earth. The wanderings of Isis in search of Osiris furnished the model for the peregrinations of Ceres.

Different names of Ceres.

Ceres, the Roman name of the goddess of corn, was unknown to the modern Greeks. They always denominated her *Damater*,[7] which is rather an epithet than a proper name. The Greeks, who always affected to pass for originals, suppressed, we think, the Egyptian name on purpose to conceal the country of that deity. As a proof of the probability of this conjecture, it may be observed, that

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[1] Lib. ix. [2] Lib. i. [3] Herod. lib. i.
[4] Asiatic Researches, vols. i. and ii. [5] Plutarch, *Isis et Osir.*
[6] This word seems to be formed of two Hebrew terms, *pheri*, "fruit," and *tzaphon* or *tzephon*, "abscondit, recondidit."
[7] Damater is compounded of the Chaldaic particle *da*, "the," and *mater*, "mother." As Isis often signified the earth, the Greeks naturally adopted that title; because, according to them, that element is the mother of all living. In the very same manner they discarded the word *Juno*, an original title of the moon, and substituted *Hera*, which intimates "mistress or lady."

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they metamorphosed the wanderings of Isis in search of Osiris into the peregrinations of Ceres in quest of Proserpine. The Romans, who were less ambitious of the character of originality, retained one of her oriental names.[1] Ceres, says Diodorus, appeared thrice in Attica during the reign of Erechtheus, which seems to import that fleets loaded with corn had thrice arrived in that country from Egypt during that period.

The immediate cause of fixing the mysteries at Eleusis.

Cecrops, the first king of Attica, had established the worship of the Saitic Athena or Minerva in that region, and consecrated his capital to that deity. Erechtheus, in his turn, introduced the worship of Isis, or Damater, who in all appearance was the tutelar deity of Busiris, his native city. The subjects of Cecrops were a colony of Saites, and readily embraced the worship of Minerva; but the aborigines of that district being accustomed to a maritime, perhaps to a piratical course of life, were more inclined to consecrate their city to Neptune the god of the sea, and to constitute him their guardian and protector. Cecrops, by a stratagem, secured the preference to Minerva, his favourite divinity. Erechtheus, in order to give equal importance to his patroness, had the address to institute the Eleusinian mysteries; and, to accomplish his design, laid hold on the opportunity above mentioned.

This appears to us to be the most probable account of the origin and institution of the Eleusinian mysteries, for which the Sicilian historian has indeed furnished the clue. We shall now proceed to detail some other circumstances which attended the original institution of these far-famed ceremonies.

Circumstances attending the first appearance of Ceres in Attica.

The archpriestess who personated the newly imported deity was entertained by one Celeus,[2] who was either viceroy of that petty district of which Eleusis was the capital, or some considerable personage in that city or its neighbourhood. Upon her immediate arrival, according to the fabulous relations of the Greeks, a farce was acted not altogether suitable to the character of a goddess whose mysteries were one day to be deemed so sacred and austere. These coarse receptions and other indecencies attending the first appearance of the goddess, that is, the Egyptian dame who assumed her character, were copied from the like unhallowed modes of behaviour practised on occasion of the solemn processions of her native country. These scommata, or coarse jokes, had an allegorical signification in Egypt; and amongst the most ancient Greeks the very same spirit was universally diffused by the oriental colonists, who from time to time arrived and settled amongst them. In process of time they abandoned the figurative and allegorical style, in consequence of their acquaintance with philosophy and abstract reasoning. In the ceremonies of religion, however, the same allegorical and typical representations which had been imported from the East were retained; but the Grecian hierophants in a short time lost every idea of their latent import, and religious, moral, or physical interpretation. Accordingly, this shameful rencounter between Ceres and Banbo,[3] or Jambe, was retained in the mysteries, though we think it was copied from Egypt, as was said above, where even that obscene action was probably an allegorical representation of something very different from what appeared to the Greeks.

At the same time that Ceres arrived in Attica, Bacchus likewise made his appearance in that country. He was entertained by one Icarus; whom, as a reward for his hospitality, he instructed in the art of cultivating the vine, and the method of manufacturing wine. Thus it appears that both agriculture and the art of managing the vintage were introduced into Athens much about the same time. Ceres was no other than a priestess of Isis; Bacchus was no doubt a priest of Osiris. The arrival of those two personages from Egypt, with a number of inferior priests in their train, produced a memorable revolution in Athens, both with respect to life, manners, and religion. The sacred rites of Isis, afterwards so famous under the name of the Eleusinian mysteries, date their institution from this period.

Mysteries. Ceres and Bacchus, who they were.

When this company of propagandists arrived at Eleusis, they were entertained by some of the most respectable persons who then inhabited that district. Their names, according to Clemens Alexandrinus, were Banbo, Dysaulis, Triptolemus, Eumolpus, and Eubulus. From Eumolpus were descended a race of priests called Eumolpidæ, who figured at Athens many ages after. Triptolemus was an ox herd, Eumolpus a shepherd, and Eubulus a swine herd. These were the first apostles of the Eleusinian mysteries. They were instructed by the Egyptian missionaries; and they, in their turn, instructed their successors. Erechtheus, or, as some say, Pandion, countenanced the seminary, and built a small temple for its accommodation in Eleusis, a city of Attica, a few miles west from Athens, and originally one of the twelve districts into which that territory was divided. Here, then, we have arrived at the scene of those renowned mysteries, which for the space of near two thousand years were the pride of Athens and the wonder of the world.

Eleusinian mysteries divided into greater and lesser.

The mysteries were divided into the greater and lesser. The latter were celebrated at Agræ, a small town on the river Ilyssus; the former were celebrated in the month which the Athenians called Boedromion,[4] the latter in the month Anthesterion.[5] The lesser mysteries, according to the fabulous legends of the Greeks, were instituted in favour of the celebrated Hercules. That hero being commanded by Eurystheus to bring up Cerberus from the infernal regions, was desirous of being initiated in the Eleusinian mysteries before he engaged in that perilous undertaking. He addressed himself to Eumolpus the hierophant for that purpose. There was a law amongst the Eleusinians prohibiting the initiation of foreigners. The priest not daring to refuse the benefit to Hercules, who was both a friend and benefactor to the Athenians, advised the hero to get himself adopted by a native of the place, and so to elude the force of the law. He was accordingly adopted by one Pyolius, and so was initiated in the lesser mysteries, which were instituted for the first time upon that occasion. But this account has all the air of a fable. The lesser mysteries were instituted by way of preparation for the greater.

Austerities and rites previous to initiation.

The person who was to be initiated in the lesser mysteries, as well as in the greater, was obliged to practise the virtue of chastity a considerable time before his admission. Besides, he was to bind himself by the most solemn vows not to divulge any part of the mysteries. At the same time, he was, according to the original institution, to be a person of unblemished moral character. These were preliminaries

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[1] According to some of the Latin etymologists, *Ceres*, or rather *Geres*, is derived from *gero*, "to bear, to carry," because the earth bears all things, or because that element is the general fruit-bearer. But as this term came to Italy immediately from the East, and not through the medium of Greece, we would rather incline to adopt an oriental etymology. The Hebrew word *cheres* signifies *arare*, "to plough;" a name naturally applicable to the goddess of husbandry.

[2] Apollod. *Bibl.* lib. iii. cap. 13.

[3] Ibid. *ubi supra*; Clem. Alexand. *Cohort.* p. 17; where the story is told with very little reserve.

[4] The third month of the Athenian year, answering to our September.

[5] The eighth month, answering to our February; but Meursius makes it November.

Mysteries. indispensably necessary in order to his admission. A bull was sacrificed to Jupiter, and the hide of that animal, called by a peculiar name (Διος Κωδιον), was carefully preserved and carried to Eleusis, where it was spread under the feet of the initiated. The candidate was then purified by bathing in the river Ilyssus, by aspersions with salt water or salt, with laurel, barley, and passing through the fire; all which rites were attended with incantations and other usages equally insignificant and ridiculous. Last of all, a young sow was sacrificed to Ceres; and this animal, according to the ritual, behoved to be pregnant. Before it was killed it was to be washed in Cantharus, one of the three harbours which formed the Piræus.

All these ceremonies being duly performed, the candidate was carried into the hall appointed for the purpose of initiation. There he was taught the first elements of those arcana which were afterwards to be more fully and more clearly revealed in the more august mysteries of Eleusis. The pupils at Agræ were called *Mystæ*, which may intimate probationers; whereas those of Eleusis were denominated *Epoptæ*, importing that they saw as they were seen.

The lesser mysteries were divided into several stages, and candidates were admitted to them according to their quality and capacity respectively. Those who were initiated in the lowest were obliged to wait five years before they were admitted to the greater. Those who had partaken of the second kind underwent a noviciate of three years; those who had been admitted to the third, one of two years; and those who had gone through the fourth were admitted to the greater at the end of one year; which was the shortest period of probation a candidate for that honour could legally undergo. Such was the process generally observed in administering the lesser mysteries.

None but natives of Athens originally admitted to the greater mysteries.

With respect to the greater mysteries, it is probable that originally none but the natives of Attica were admitted to partake of them. In process of time, however, the pale was extended so far and wide as to comprehend all who spoke the Greek language. All foreigners were debarred from those sacred rites. They tell us, however, that Hercules, Bacchus, Castor and Pollux, Æsculapius, and Hippocrates, were initiated in an extraordinary manner, from a regard to their high character and heroic exploits. All barbarians, too, were excluded; yet Anacharsis the Scythian was indulged that privilege, in consequence of his reputation for science and philosophy. All persons guilty of manslaughter, though even accidentally or involuntarily, all magicians, enchanters, in a word, all impious and profane persons, were expressly prohibited from sharing the benefit of this Pagan sacrament. At last, however, the gate became wider, and crowds of people, of all nations, kindreds, and languages, provided their character was fair and irreproachable, rushed in by it. In process of time the Athenians initiated even their infants; but this, we imagine, must have been a kind of lustration or purification, from which it was supposed that they derived a kind of moral ablution from vice, and were thought to be under the peculiar protection of the goddess.

Celebration and initiation.

The celebration of the mysteries began on the fifteenth day of the month Boedromion, and, according to most ancient authors, lasted nine days. Meursius has enumerated the transactions of each day, which are much too numerous to fall within the compass of this article; we must therefore refer our curious reader to the author just mentioned. Some days before the commencement of the festival, the præcones, or public criers, invited all the initiated, and all the pretenders to that honour, to attend the festival, with clean hands and a pure heart, and with the knowledge of Mysteries. the Greek language.

On the evening of the fifteenth day of the month called Boedromion the initiations commenced. Our readers will observe, that all the most sacred and solemn rites of the Pagan superstition were performed during the night; they were indeed generally works of darkness. On this day there was a solemn cavalcade of Athenian matrons from Athens to Eleusis, in carriages drawn by oxen. In this procession the ladies used to rally one another in pretty loose terms, in imitation, we suppose, of the Isiac procession described by Herodotus, which has been mentioned above. The most remarkable object in this procession was the *Mundus Cereris*, contained in a small coffer or basket. This was carried by a select company of Athenian matrons, who, from their office, were styled *Camphoræ*. In this coffer were lodged the comb of Ceres, her mirror, a serpentine figure, some wheat and barley, the pudenda of the two sexes, and perhaps some other articles which we have not been able to discover. The procession ended at the temple, where this sacred charge was deposited with the greatest solemnity.

We have upon record no description of the temple of Eleusis. Pausanias intended to have described it, but says that he was diverted from his design by a dream.[1] Strabo informs us, that the mystic sanctuary was as large as a theatre, and that it was built by Ictinus.[2] In the porch, or outer part of this temple, the candidates were crowned with garlands of flowers, which they call *himera*, or "the desirable." They were at the same time dressed in new garments, which they continued to wear till they were quite worn out. They then washed their hands in a laver filled with holy water; a ceremony which intimated the purity of their hearts and hands. Before the doors were locked, one of the officers of the temple proclaimed with a loud voice a stern mandate, enjoining all the uninitiated to keep at a distance from the temple, and denouncing the most terrible menaces if any should dare to disturb or pry into the holy mysteries. Nor were these menaces without effect; for if any person was found to have crowded into the sanctuary, even through ignorance, he was put to death without mercy. Every precaution having been taken to secure secrecy, the initiatory ceremonies now began. But before we describe these, we must lay before our readers a brief account of the ministers and retainers of these secrets of Paganism.

The hierophant.

The chief minister of these far-famed mysteries was the hierophant. He was styled *king*, and enjoyed that dignity during life, and was always by birth an Athenian. He presided in the solemnity, as is evident from his title. This personage, as we learn from Eusebius, represented the demiurgus, or creator of the world. "Now, in the mysteries of Eleusis," says that father, "the hierophant is dressed out in the figure of the demiurgus." What this demiurgus was, we learn from the same writer. As this whole institution was copied from the Egyptians, we may rest assured that the figure of the Eleusinian demiurgus was borrowed from the same quarter. "As for the symbols of the Egyptians," says he, quoting from Porphyry,[3] "they are of the following complexion. The demiurgus, whom the Egyptians call *Kneph*, is figured as a man of an azure colour, shaded with black, holding in his right hand a sceptre, and in his left a girdle, and having on his head a royal wing or feather wreathed round." Such, we imagine, was the equipment of the Eleusinian hierophant. This person was likewise styled *prophet*. He was to be of the family of the Eumolpidæ; was obliged to make a vow of perpetual chas-

[1] Lib. ix. [2] See Eleusis. [3] *Præparatio Evangelii.*

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tity; and even his voice, hair, and attitude, were adjusted to the ritual.

The daduchus.

The next minister was the daduchus, or torch-bearer, who, according to the father above quoted, was attired like the sun. This minister resembled the sun, because that luminary was deemed the visible type of the supreme demiurgus, and his vicegerent in governing and arranging the affairs of this lower world.

The priests.

The third was the person who officiated at the altar. He was habited like the moon. His office was to implore the favour of the gods for all the initiated. We should rather imagine, that the person at the altar, as he resembled the moon, was intended to represent the goddess herself: for the Egyptian Isis, who was the archetype of Ceres, was sometimes the moon and sometimes the earth.

The herald.

The sacred herald was another principal actor in this solemn exhibition. His province was to recite every thing that, according to the ritual, was to be communicated to the novices; and he probably represented Thyoth or Thoth, that is, Hermes or Mercury, the interpreter of the gods.

The curators, &c.

Besides these, there were five epimeletæ or curators, of whom the king was one, who jointly directed the whole ceremonial. Lastly, There were ten priests to offer the sacrifices. There were no doubt many officers of inferior note employed upon these occasions; but these were only insignificant appendages, whose departments have not been transmitted to posterity.

After this detail of the ministers of this solemn service, we return to the *mystæ*, or candidates for initiation. Some of the fathers of the church[1] mention a hymn composed by the celebrated Orpheus, which was sung by the mystagogue or king upon that occasion. This hymn appears to us one of those spurious compositions which abounded in the first ages of Christianity, and which the pious apologists often adopted without sufficient examination. That some sacred hymn was chanted upon that occasion, we think highly probable; but that the one in question was either composed by Orpheus, or used at the opening of these ceremonies, to us appears somewhat problematical.

The petroma.

Before the ceremony opened, a book was produced, which contained every thing relating to the Teletæ. This was read over in the ears of the mystæ, who were ordered to write out a copy of it for themselves. This book was kept at Eleusis, in a sacred repository, formed by two stones exactly fitted to each other, and of a very large size. This repository was called *petroma*. At the annual celebration of the greater mysteries, these stones were taken asunder, and the book taken out, which, after being read to the mystæ, was replaced in the same casement.

Commencement of the initiations.

The initiations began with a representation of the wanderings of Ceres, and her bitter and loud lamentations for the loss of her beloved daughter. Upon this occasion, no doubt, a figure of that deity was displayed to the mystæ, while loud lamentations echoed from every corner of the sanctuary. One of the company having kindled a firebrand at the altar, and sprung to a certain place in the temple, waving the torch with the utmost fury, a second snatched it from him, roaring and waving it in the same frantic manner, and a third, fourth, &c. in the most rapid succession. This was done to imitate Ceres, who was said to have perlustrated the globe of the earth with a flaming pine in her hand, which she had lighted at Mount Ætna.

Questions put to the mystæ.

When the pageant of the goddess was supposed to arrive at Eleusis, a solemn pause ensued, and a few trifling questions were put to the mystæ. What these questions were, is evident from the answers. "I have fasted; I have drunk the liquor; I have taken the contents out of the coffer, and, having performed the ceremony, have put them into the hamper; I have taken them out of the hamper, and put them again into the coffer." The meaning of these answers, we conjecture, was this: "I have fasted, as Ceres fasted whilst in search of her daughter; I have drunk off the wort, as she drank when given her by Banbo; I have performed what Ceres taught her first disciples to perform, when she committed to them the sacred hamper and coffer." After these interrogatories, and the suitable responses, the *Mundus Cereris* was displayed before the eyes of the mystæ, and the *mystagogue* or hierophant, or perhaps the sacred herald by his command, read a lecture on the allegorical import of those sacred symbols. This was heard with the most profound attention, and a solemn silence prevailed throughout the fane. Such was the first act of this religious farce, which perhaps consisted originally of nothing more.

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Traditions respecting the origin of the universe, &c.

After the exposition of the *Mundus Cereris*, and the import of her wanderings, many traditions were communicated to the mystæ concerning the origin of the universe and the nature of things. The doctrines delivered in the greater mysteries, says Clemens Alexandrinus, "relate to the nature of the universe. Here all instruction ends. Things are seen as they are; and nature, and the things of nature, are given to be comprehended." To the same purpose Cicero: "Which points being explained and reduced to the standard of reason, the nature of things, rather than that of the gods, is discovered." The father of the universe, or the supreme demiurgus, was represented as forming the chaotic mass into the four elements, and producing animals, vegetables, and all kinds of organized beings, out of those materials. They say that they were informed of the secrets of the anomalies of the moon, and the eclipses of the sun and moon; and, according to Virgil,

> Unde hominum genus, et pecudes, unde imber et ignes.

What system of cosmogony those hierophants adopted, is evident from the passage above quoted from Eusebius; and, from the account immediately preceding, it was that of the most ancient Egyptians, and of the orientals in general. This cosmogony is beautifully and energetically exhibited in Plato's Timæus, and in the genuine spirit of poetry by Ovid in the beginning of his Metamorphoses.

Exploits of the gods, and their origin.

The next scene exhibited upon the stage, on this solemn occasion, consisted of the exploits and adventures of the gods, demigods, and heroes, who had from time to time been advanced to divine honours. These were displayed as passing before the mystæ in pageants fabricated for that important purpose. This was the original mode amongst the Egyptians, and was no doubt followed by their Eleusinian pupils. These adventures were probably demonstrated to have been allegorical, symbolical, hieroglyphical; at least they were exhibited in such a favourable point of view, as to dispel those absurdities and inconsistencies with which they were sophisticated by the poets and by the vulgar.

Unity of the Supreme Being maintained in the mysteries.

With respect to the origin of those factitious deities, it was discovered that they had been originally men who had been exalted to the rank of divinity in consequence of their heroic exploits, their useful inventions, or their beneficent actions. This is so clear from the two passages quoted from Cicero by Bishop Warburton,[2] that the fact cannot be contradicted. But that prelate has not informed us so precisely, whether the mystagogues represented them as nothing more than dead men in their present state, or as beings who were actually existing in a deified state, and executing the functions assigned them in the rubric of Paganism. Another query naturally occurs; that is, to what purpose did the mystagogues apply this communica-

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[1] Justin, Eusebius, Clemens Alexandrinus.

[2] Divine Legation of Moses.

Mysteries. tion? That the hierophants did actually represent those deified mortals in the latter predicament, is obvious from another passage quoted from Cicero by the same prelate. "What think you," says the illustrious Roman, "of those who assert that valiant, or famous, or powerful men, have obtained divine honours after death; and that these are the very gods now become the objects of our worship, our prayers, and adoration? Euhemerus tells us when these gods died, and where they lie buried. I forbear to speak of the sacred and august rites of Eleusis. I pass by Samothrace and the mysteries of Lemnos, whose hidden rites are celebrated in darkness, and amidst the thick shades of groves and forests." If, then, those deified mortals were become the objects of worship and prayers, there can be no doubt of the belief of their deified existence. The allusion to the Eleusinian and other Pagan mysteries, towards the close of the quotation, places the question beyond the reach of controversy. But though, according to this account, "there were gods many and lords many," yet it is evident, from the passage quoted from Eusebius in the preceding part of this article, that the unity of the Supreme Being was maintained, exhibited, and inculcated. This was the original doctrine of the hierophants of Egypt. It was maintained by Thales, and all the retainers of the Ionian school. It was the doctrine of Pythagoras, who probably gleaned it up in the country just mentioned, in connection with many other dogmas which he had the assurance to claim as his own.

Offices of the other gods.

But however the unity, and perhaps some of the most obvious attributes, of the Supreme Author of nature, might be illustrated and inculcated, the tribute of homage and veneration due to the subordinate divinities was by no means neglected. The initiated were taught to look to the *dii majorum gentium* with a superior degree of awe and veneration, as beings endowed with an ineffable measure of power, wisdom, purity, goodness, &c. These were, if we may use the expression, the prime favourites of the Monarch of the universe, who were admitted into his immediate presence, and who received his behests from his own mouth, and communicated them to his subordinate officers, prefects, lieutenants, and others. These they were exhorted to adore; to them they were to offer sacrifices, prayers, and every other act of devotion, both on account of the excellency of their nature and the high rank they bore at the court of heaven. They were instructed to look up to hero-gods and demigods, as being exalted to the high rank of governors of different parts of nature, as the immediate guardians and protectors of the human race; in short, as gods near at hand, as prompters to a virtuous course, and assistants in it; as ready upon all occasions to confer blessings upon the virtuous and deserving. Such were the doctrines taught in the Teletæ with respect to the nature of the Pagan divinities, and the worship and devotion enjoined to be offered them by the mysteries.

Plan for accomplishing the ends proposed in the mysteries.

As the two principal ends proposed by these initiations were the exercise of heroic virtues in men, and the practice of sincere and uniform piety by the candidates for immortal happiness, the hierophants had adopted a plan of operations excellently accommodated to both these purposes. The virtuous conduct and heroic exploits of the great men and demigods of early antiquity were magnified by the most pompous eulogiums, enforced with suitable exhortations to animate the votaries to imitate so noble and alluring an example. But this was not all; the heroes and demigods themselves were displayed in pageants or vehicles of celestial light. Their honours, offices, habitations, attendants, and other appendages, in the capacity of demons, were exhibited with all the pomp and splendour that the sacerdotal college were able to devise. The sudden glare of mimic light, the melting music stealing upon the ear, the artificial thunders reverberated from the roof and walls of the temple, the appearance of fire and ethereal radiance, the vehicles of flame, the effigies of heroes and demons, adorned with crowns of laurel, emitting rays from every sprig, the fragrant odours and aromatic gales which breathed from every quarter, all dexterously counterfeited by sacerdotal mechanism, must have filled the imagination of the astonished votaries with pictures at once tremendous and transporting. Add to this, that every thing was transacted in the dead of night, amidst a dismal gloom, whence the most bright effulgence instantaneously burst upon the sight. By this arrangement, the aspirants to initiation were wonderfully animated to the practice of virtue while they lived, and inspired with the hope of a blessed immortality when they died. At the same time, their awe and veneration for the gods of their country were wonderfully enhanced by reflecting on the appearances above described. Accordingly Strabo very judiciously observes, "that the mystical secrecy of the sacred rites preserves the majesty of the Deity, imitating its nature, which escapes our apprehension. For these reasons, in celebrating the Teletæ, the demons were introduced in their deified or glorified state.

Mysteries.

Private virtues inculcated in the mysteries by the doctrine of a future state.

But as all the candidates for initiation might not aspire to the rank of heroes and demigods, a more easy and a more attainable mode of conduct, in order to arrive at the palace of happiness, behoved to be opened. Private virtues were inculcated, and these too were to meet a condign reward. But, unhappily, this present life is too often a chequered scene, where virtue is depressed and trodden under foot, and vice lifts up its head and rides triumphant. It is a dictate of common sense, that virtue should sooner or later emerge, and vice sink into contempt and misery. Here, then, the conductors of the mysteries properly and naturally adopted the doctrine of a future state of rewards and punishments. The dogma of the immortality of the human soul was elucidated, and carefully and pathetically inculcated. This doctrine was likewise imported from Egypt; for Herodotus[1] informs us, "that the Egyptians were the first people who maintained the immortality of the human soul." The Egyptian immortality, however, according to him, was only the metempsychosis or transmigration of souls. This was not the system of the ancient Egyptians, nor indeed of the Teletæ. In these, a metempsychosis was admitted; but that was carried forward to a very distant period, to wit, to the grand Egyptian period of 36,000 years.

Emblems of Elysium and Tartarus.

As the mystagogues well knew that the human mind is more powerfully affected by objects presented to the eyes than by the most engaging instructions conveyed by the ear, they made the emblems of Elysium and Tartarus pass in review before the eyes of their novices. There the Elysian scenes, so nobly described by the Roman poet, appeared in mimic splendour; and, on the other hand, the gloom of Tartarus, Charon's boat, the dog of hell, the furies with tresses of snakes, the tribunal of Minos and Rhadamanthus, &c. were displayed in all their terrific state. Tantalus, Ixion, Sisyphus, the daughters of Danaus, and others, were represented in pageants before their eyes. These exhibitions were accompanied with most horrible cries and howlings, thunders, lightning, and other objects of terror, which we shall mention in their proper place.

The three laws of Triptolemus.

No contrivance could be better accommodated to animate the pupils to the practice of virtue on the one hand, or to deter them from indulging vicious passions on the other. It resembled opening heaven and hell to a harden-

[1] Lib. ii.

Mysteries. ed sinner. The practices inculcated in celebrating the mysteries are too numerous to be detailed in this imperfect sketch. The worship of the gods was strictly enjoined, as has been shown above. The three laws, generally ascribed to Triptolemus, were inculcated: 1. To honour their parents; 2. To honour the gods with the first fruits of the earth; 3. Not to treat brute animals with cruelty. These laws were imported from Egypt, and were communicated to the Eleusinians by the original missionaries. Cicero makes the civilization of mankind one of the most beneficial effects of the Eleusinian institutions: "Nullum mihi, cum multo eximia divinaque videntur Athenæ tuæ peperisse; tum nihil melius illis mysteriis, quibus ex agresti immanique vita, exculti ad humanitatem, et mitigati sumus; initiaque, ut appellantur, ita revera principia vitæ cognovimus; neque solum cum lætitia vivendi rationem accepimus, sed etiam cum spe meliore moriendi." Hence it is evident that the precepts of humanity and morality were warmly recommended in these institutions. The virtue of humanity was extended, one may say, even to the brute creation, as appears from the last of Triptolemus's laws above quoted. Some articles were enjoined in the Teletæ which may appear to us of less importance, which, however, in the symbolical style of the Egyptians were abundantly significant. The initiated were "commanded to abstain from the flesh of certain birds and fishes; from beans, from pomegranates and apples, which were deemed equally polluting. It was taught, that to touch the plant of asparagus was as dangerous as the most deadly poison. Now, says Porphyry, whoever is versed in the history of the visions, knows for what reason they were commanded to abstain from the flesh of birds."

The initiated bound themselves by oaths to observe the precepts of the mysteries.

The initiated then bound themselves by dreadful oaths to observe most conscientiously, and to practise, every precept tendered to them in the course of the Teletæ; and at the same time never to divulge one article of all that had been heard or seen by them upon that occasion. In this they were so exceedingly jealous, that Æschylus the tragedian was in danger of capital punishment for having only alluded to one of the Eleusinian arcana in a tragedy of his; and one of the articles of indictment against Diagoras the Melian was, his having spoken disrespectfully of the mysteries, and dissuaded people from partaking of them. It must, then, be allowed, that the institution of the mysteries was of infinite advantage to the Pagan world. They were indeed a kind of sacraments, by which the initiated bound themselves by a solemn vow to practise piety towards the gods, justice and humanity towards their fellow men, and gentleness and tenderness towards the inoffensive part of the brute creation. The Pagans themselves were so thoroughly convinced of this fact, that, in their disputes with the apologists for Christianity, they often appealed to the Teletæ, and contrasted their maxims with the most sublime doctrines of that heavenly institution.

Horrible spectres and pleasing scenes alternately exhibited.

In order to impress these maxims the more deeply upon the minds of the novices, and to fix their attention more stedfastly upon the lectures which were delivered them by the mystagogue or the sacred herald, a mechanical operation was played off at proper intervals during the course of the celebration. "Towards the end of the celebration," says Stobæus, "the whole scene is terrible; all is trembling, shuddering, sweat, and astonishment. Many horrible spectres are seen, and strange cries and howlings uttered. Light succeeds darkness; and again the blackest darkness the most glaring light. Now appear open plains, flowery meads, and waving groves, where are seen dances and choruses; and various holy phantasies enchant the sight. Melodious notes are heard from far, with all the sublime symphony of the sacred hymns. The pupil now is completely perfect, is initiated, becomes free, released, and walks about with a crown on his head, and is admitted to bear a part in the sacred rites." Aristides (*de Myst. Eleus.*) calls Eleusis "a kind of temple of the whole earth, and of all that man beholds done in the most dreadful and the most exhilarating manner. In what other place have the records of fable sung of things more marvellous? or in what region upon earth have the objects presented to the eye borne a more exact resemblance to the sounds which strike the ear? What object of sight have the numberless generations of men and women beheld, comparable to those exhibited in the ineffable mysteries?" To the same purpose, Pletho, in the oracles of Zoroaster, informs us, "that frightful and shocking apparitions, in a variety of forms, used to be displayed to the mystæ in the course of their initiation;" and a little after, he adds, "that thunder and lightning and fire, and every thing terrible which might be held symbolical of the divine presence, were introduced." Claudian, in his poem *De Rapta Proserpina*, gives an elegant, though brief, description of this phenomenon, which throws some light upon the passages above quoted. Mysteries.

> Jam mihi cernuntur trepidis delubra moveri
> Sedibus et claram dispergere culmina lucem,
> Adventum testata Deæ; jam magnus ab imis
> Auditur fremitus terris, templumque remugit
> Cecropidum.

A kind of baptismal ablution in the mysteries.

The sight of those appearances was called the *autopsia*, or "the real presence;" hence those rites were sometimes called *epoptica*. The *epoptæ* were actually initiated, and were admitted into the *sanctum sanctorum*, and bore a part in the ceremonial; whereas the *mystæ*, who had only been initiated in the lesser mysteries at Agræ, were obliged to take their station in the porch of the temple. The candidates for initiation bathed themselves in holy water, and put on new clothes, all of linen, which they continued to wear till they were quite torn, and then they were consecrated to Ceres and Proserpine. From the ceremony of bathing, they were denominated *hydrani;* and this again was a kind of baptismal ablution. Whether the phrases of *washing away sin, putting on the Lord Jesus Christ, putting off the old man with his deeds, putting on a robe of righteousness, being buried in baptism*, the words *mystery, perfect, perfection*, which occur so frequently in the New Testament, especially in the writings of the apostle Paul, are borrowed from the Pagan mysteries, or from usages current amongst the Jews, we leave to our more learned readers to determine.

The initiated declared perfect men.

The epoptæ having sustained all those fiery trials, heard and seen every thing requisite, taken upon them the vows and engagements above narrated, and, in a word, having shown themselves good soldiers of Ceres and Proserpine, were now declared perfect men. They might, like Cebes's virtuous man, travel wherever they chose; those wild beasts (the human passions) which tyrannise over the rest of mankind, and often destroy them, had no longer dominion over them. They were now not only perfect, but regenerated men. They were now crowned with laurel, as was said above, and dismissed with two barbarous words, Κογξ ὀμπαξ, *Konx ompax*, of which perhaps the hierophants themselves did not comprehend the import. They had been introduced by the first Egyptian missionaries, and retained in the sacra after their signification was lost. This was a common practice amongst the Greeks. In the administration of their religious ceremonies, they retained many names of persons, places, things, customs, &c. which had been introduced by the Phœnicians and Egyptians, from whom they borrowed their system of idolatry. These terms constituted the language of the gods, so often mentioned by the prince of poets. To us the words in question appear to be Syriac, and to signify, *Be vigilant, be innocent.*

Mysteries. Numerous and important were the advantages supposed to redound to the initiated, from their being admitted to partake of the mysteries, both in this life and that which is to come. First, they were highly honoured, and even revered by their contemporaries; indeed, they were looked up to as a kind of sacred persons, and were, in reality, consecrated to Ceres and Proserpine. Secondly, they were obliged by their oath to practise every virtue, religious, moral, political, public, and private. Thirdly, they imagined, that sound advice and happy measures of conduct were suggested to the initiated by the Eleusinian goddesses. Accordingly, says Pericles, the celebrated Athenian statesman, "I am convinced, that the deities of Eleusis inspired me with this sentiment, and that this stratagem was suggested by the principle of the mystic rites." There is a beautiful passage in Aristophanes's comedy of the *Ranæ*[1] to the very same purpose, of which we shall subjoin the following periphrasis. It is sung by the chorus of the initiated:—

Let us to flow'ry mead repair,
With deathless roses blooming,
Whose balmy sweets impregn the air,
Both hills and dales perfuming.
Since fate benign our choir has join'd,
We'll trip in mystic measure;
In sweetest harmony combin'd
We'll quaff full draughts of pleasure.
For us alone the pow'r of day
A milder light dispenses;
And sheds benign a mellow'd ray
To cheer our ravish'd senses:
For we beheld the mystic show,
And brav'd Eleusis' dangers,
We do and know the deeds we owe
To neighbours, friends, and strangers.

Euripides, in his *Bacchæ*,[2] introduces the chorus extolling the happiness of those who had been acquainted with God, by participating in the holy mysteries, and whose minds had been enlightened by the mystical rites. They boast, that "they had led a holy and unblemished life, from the time that they had been initiated in the sacred rites of Jupiter Idæus, and from the time that they had relinquished celebrating the nocturnal rites of Bacchus, and the banquets of raw flesh torn off living animals." To this sanctity of life they had no doubt engaged themselves, when they were initiated in the mysteries of that god. The Eleusinian epoptæ derived the same advantages from their sacramental engagements. Fourthly, the initiated were imagined to be the peculiar wards of the Eleusinian goddesses. These deities were supposed to watch over them, and often to avert impending danger, and to rescue them when beset with troubles. Our readers will not imagine that the initiated reaped much benefit from the protection of their Eleusinian tutelary deities; but it was sufficient that they believed the fact, and actually depended upon their interposition. Fifthly, the happy influences of the Teletæ were supposed to administer consolation to the epoptæ in the hour of dissolution; for, says Isocrates, "Ceres bestowed upon the Athenians two gifts of the greatest importance; the fruits of the earth, which were the cause of our no longer leading a savage course of life; and the Teletæ, for they who partake of these entertain more pleasant hopes both at the end of life, and eternity afterwards." Another author tells us,[3] "that the initiated were not only often rescued from many hardships in their lifetime, but at death entertained hopes that they should be raised to a more happy condition." Sixthly, after death, in the Elysian fields they were to enjoy superior degrees of felicity, and were to bask, in eternal sunshine, Mysteries. to quaff nectar, and feast upon ambrosia, &c.

Interestedness of the priests. The priests were not altogether disinterested in this salutary process. They made their disciples believe that the souls of the uninitiated, when they arrived in the infernal regions, should roll in mire and dirt, and with very great difficulty arrive at their destined mansion. Hence Plato introduces Socrates[4] observing, "that the sages who introduced the Teletæ had positively affirmed, that whatever soul should arrive in the infernal mansions *unhousell'd* and *unanneal'd*, should lie there immersed in mire and filth." "And as to a future state," says Aristides, "the initiated shall not roll in mire and grope in darkness; a fate which awaits the unholy and uninitiated." It is not hard to conceive with what a commanding influence such doctrines as these must have operated on the generality of mankind.

Remarks of Diogenes and Antisthenes. When the Athenians advised Diogenes to get himself initiated, and enforced their arguments with the above considerations, "It will be pretty enough," replied the philosopher, "to see Agesilaus and Epaminondas wallowing in the mire, while the most contemptible rascals who have been initiated are strutting in the islands of bliss."

When Antisthenes was to be initiated in the Orphic mysteries, and the priest was boasting of the many astonishing benefits which the initiated should enjoy in a future state,[5] "Why, forsooth," says Antisthenes, "'tis wonder your reverence don't even hang yourself in order to come at them the sooner."

All the world crowded to Eleusis. When such benefits were expected to be derived from the mysteries, no wonder if all the world crowded to the Eleusinian standard. After the Macedonian conquests, the hierophants abated much of their original strictness. By the age of Cicero, Eleusis was a temple whither all nations resorted to partake of the benefits of that institution. We find that almost all the great men of Rome were initiated. The hierophants, however, would not admit Nero, on account of the profligacy of his character. Few others were refused that honour; even the children of the Athenians were admitted. But this, we think, was rather a lustration or consecration, than an initiation. Perhaps it paved the way for the more august ceremony, as the Christian baptism does among us for the other sacrament.

Degeneracy of the mysteries. That this institution gradually degenerated, can hardly be questioned; but how much, and in what points, we have not been able to investigate. The fathers of the church, from whom that charge is chiefly to be collected, are not always to be trusted, especially when they set themselves to arraign the institutions of Paganism. There were indeed several ancient authors, such as Melanthius, Menander, Sotades, &c. who wrote purposely on the subject in question; but their works are long since irrecoverably lost. For this reason, modern writers, who have professedly handled it, have not always been successful in their researches. The two who have laboured most indefatigably, and perhaps most successfully, in this field, are Meursius and Warburton. The former, in his *Liber Singularis*, has collected every thing that can be gleaned from antiquity relating to the ceremonial of these institutions, without, however, pointing out their original, or elucidating the end and import of their establishment. The latter has drawn them into the vortex of a system which has, in many instances, led him to ascribe to them a higher degree of merit than we think they deserve. These instances we would willingly have noticed in our progress, had the limits prescribed us, in treating the subject, admitted such a discussion.

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[1] Act. i. [2] Act i. near the beginning, and in many other places. [3] Aristides, *de Myst. Eleus.* [4] Plato *in Phædo.* [5] Diogenes Laertius.

Mystical ‖ Mystics.

If Diodorus the Sicilian may be believed, these mysteries, which were celebrated with such wonderful secrecy at Eleusis, were communicated to all mankind amongst the Cretans. This, however, we think, is rather problematical. We imagine that that excellent historian has confounded the mysteries of Cybele with those of the Eleusinian Ceres. These two deities were undoubtedly one and the same, that is, the moon or the earth. Hence it is probable that there was a striking resemblance between the sacred mysteries of the Cretans and Eleusinians.

Mysteries abolished by the Emperor Theodosius.

This institution continued in high reputation to the age of St Jerome, as appears from the following passage: "Hierophantæ quoque Atheniensium legant usque hodie cicutæ sorbitione castrari." The Emperor Valentinianus intended to have suppressed them; but Zozimus[1] informs us that he was diverted from his design by the proconsul of Greece. At length Theodosius the elder, by an imperial edict, prohibited the celebration of these as well as of all the other sacra of Paganism. These mysteries, instituted in the reign of Erechtheus, maintained their ground to the period just mentioned, that is, nearly 2000 years, during which space the celebration of them never had been interrupted but once. When Alexander the Great massacred the Thebans and razed their city, the Athenians were so much affected with this melancholy event that they neglected the celebration of that festival.

Mystics.

There were almost numberless other mysterious institutions among the ancient Pagans, of which these sketched above were the most celebrated. The Samothracian mysteries, instituted in honour of the Cabiri, were likewise of considerable celebrity, and were supposed to confer much the same blessings with the Eleusinian, but were not of equal celebrity. The Cabiri were Phœnician and likewise Egyptian deities.[2] The learned Bochart has explained their origin, number, names, and some part of their worship. The Orphic mysteries were likewise famous among the Thracians. Orpheus learned them in Egypt, and they were nearly the same with the sacra Bacchanalia of the Greeks. There were likewise the mysteries of Jupiter Idæus in great request among the Cretans, those of the Magna Mater or Cybele, celebrated in Phrygia. To enumerate and detail all these would require a complete volume. We hope our readers will be fully satisfied with the specimen exhibited above. We are convinced many things have been omitted which might have been inserted, but we have collected the most curious and the most important. (o. o. o. o.)

Other mysteries amongst the Pagans of less celebrity.

MYSTICAL, something mysterious or allegorical. Some of the commentators on the sacred writings, besides a literal, discover also a mystical meaning. The sense of Scripture, say they, is either that immediately signified by the words and expressions in the common use of language; or it is mediate, sublime, typical, and mystical. The literal sense they again divide into properly literal, which is contained in the words taken simply and properly; and metaphorically literal, where the words are to be taken in a figurative and metaphorical sense. The mystical sense of Scripture they divide into three kinds; the first corresponding to faith, and called allegorical; the second to hope, called anagogical; and the third to charity, called the tropological sense. And sometimes they take the same word in Scripture in all the four senses. Thus the word *Jerusalem* literally signifies the capital of Judæa; allegorically, the church militant; tropologically, a believer; and anagogically, heaven. So, the passage in Genesis, "Let there be light, and there was light," literally signifies corporeal light; by an allegory, the Messiah; in the tropological sense, grace; and anagogically, beatitude, or the light of glory.

MYSTICS, *mystici*, a kind of religious sect, distinguished by their professing pure, sublime, and perfect devotion, with an entire disinterested love of God, free from all selfish considerations. The mystics, to excuse their fanatical ecstacies, appeal to that passage of St Paul, where he says, "The spirit prays in us by sighs and groans that are unutterable." Now, if the spirit, say they, pray in us, we must resign ourselves to its motions, and be swayed and guided by its impulse, by remaining in a state of mere inaction. Hence passive contemplation is that state of perfection to which the mystics all aspire. The authors of this mystical science, which sprung up towards the close of the third century, are not known; but the principles from which it was formed are manifest. Its first promoters proceeded upon the known doctrine of the Platonic school, which was also adopted by Origen and his disciples, that the divine nature was infused through all human souls; or that the faculty of reason, from which proceed the health and vigour of the mind, was an emanation from God into the human soul, and comprehended in it the principles and elements of all truth, human and divine. They denied that men could by labour or study excite this celestial flame in their breasts; and therefore they disapproved highly of the attempts of those who, by definitions, abstract theorems, and profound speculations, endeavoured to form distinct notions of truth, and to discover its hidden nature. On the contrary, they maintained that silence, tranquillity, repose, and solitude, accompanied with such acts as might tend to extenuate and exhaust the body, were the means by which the hidden and internal word was excited to produce its latent virtues, and to instruct men in the knowledge of divine things. They reasoned in this manner. Those who behold with a noble contempt all human affairs, who turn away their eyes from terrestrial vanities, and shut all the avenues of the outward senses against the contagious influences of a material world, must necessarily return to God when the spirit is thus disengaged from the impediments which prevented that happy union. And in this blessed frame they not only enjoy inexpressible raptures from their communion with the Supreme Being, but are also invested with the inestimable privilege of contemplating truth undisguised and uncorrupted in its native purity, whilst others behold it in a vitiated and delusive form. The number of the mystics increased in the fourth century, under the influence of the Grecian fanatic, who gave himself out as Dionysius the Areopagite, disciple of St Paul, and probably lived about this period; and, by pretending to higher degrees of perfection than other Christians, and practising greater austerities, their cause gained ground, especially in the eastern provinces, in the fifth century. A copy of the pretended works of Dionysius was sent by Balbus to Louis the Meek in the year 824, which kindled the holy flame of mysticism in the western provinces, and filled the Latins with the most enthusiastic admiration of this new religion. In the twelfth century, these mystics took the lead in their method of expounding Scripture; and, by searching for mysteries and hidden meanings in the plainest expressions, forced the word of God into a conformity with their visionary doctrines, their enthusiastic feelings,

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[1] *Advers. Jovin.*

[2] Sanchoniathon and Herodotus.

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MYSTRUM, a liquid measure amongst the ancients, containing the fourth part of the cyathus, and weighing two drachms and a half of oil, or two drachms and two scruples of water or wine. It answers nearly to a spoonful with us.

MYTHOLOGY

Definition. Is a term compounded of two Greek words, and in its original import it signifies any kind of fabulous doctrine. In its more appropriated sense, it means those fabulous details concerning the objects of worship which were invented and propagated by men who lived in the early ages of the world, and by them transmitted to succeeding generations, either by written records or by oral tradition.

As the theology and mythology of the ancients are almost inseparably connected, it will be impossible for us to develope the latter, without often introducing some observations relating to the former. We must therefore entreat the indulgence of our readers, if upon many occasions we would hazard a few strictures on the names, characters, adventures, and functions of such Pagan divinities as may have furnished materials for those fabulous narrations which the nature of the subject may lead us to discuss.

Origin of fable. With respect to *fable*, it may be observed in general, that it is a creature of the human imagination, and derives its birth from that love of the marvellous which is in a manner congenial to the soul of man. The appearances of nature which every day occur, objects, actions, and events, which succeed each other by a kind of routine, are too familiar, too obvious and uninteresting, either to gratify curiosity or to excite admiration. On the other hand, when the most common phenomena in nature or life are new-modelled by the plastic power of a warm imagination; when they are diversified, compounded, embellished, or even arranged and moulded into forms which seldom or perhaps never occur in the ordinary course of things; novelty generates admiration, a passion always attended with delightful sensations. Here then we imagine we have discovered the very source of fiction and fable. They originated from that powerful propensity in our nature towards the new and surprising, animated by the delight with which the contemplation of them is generally attended.

Many circumstances contributed to extend and establish the empire of fable. The legislator laid hold on this bias of human nature, and of course employed fable and fiction as the most effectual means to civilize a rude, unpolished world. The philosopher, the theologist, the poet, the musician, each in his turn made use of this vehicle to convey his maxims and instructions to the savage tribes. They knew that *truth*, simple and unadorned, is not possessed of charms powerful enough to captivate the heart of man in his present corrupt and degenerate state. This consideration, which did indeed result from the character of their audience, naturally led them to employ fiction and allegory. From this was derived the allegorical taste of the ancients, and especially of the primary sages of the East.

Boldness of the oriental mythology. Though almost every nation on the face of the globe, however remote from the centre of population, however savage and averse from cultivation, has fabricated and adopted its own system of mythology, the orientals have distinguished themselves in a peculiar manner, by the boldness, the inconsistency, and the extravagance of their mythology. The genial warmth of those happy climes, the fertility of the soil, which afforded every necessary, every conveniency, and often every luxury of life, without depressing their spirits by laborious exertions; the face of nature perpetually blooming around them, the skies smiling with uninterrupted serenity; all contributed to inspire the orientals with a glow of fancy and a vigour of imagination rarely to be met with in less happy regions. Hence every object was swelled beyond its natural dimensions. Nothing was great or little in moderation, but every sentiment was heightened with incredible hyperbole. The magnificent, the sublime, the vast, the enormous, the marvellous, first sprung up, and were brought to maturity, in those native regions of fable and fairy land. As nature, in the ordinary course of her operations, exhibited neither objects nor effects adequate to the extent of their romantic imaginations, they naturally deviated into the fields of fiction and fable. Of consequence, the custom of detailing fabulous adventures originated in the East, and was from thence transplanted into the western countries.

As the allegorical taste of the eastern nations had sprung from their propensity to fable, and as that propensity had in its turn originated from the love of the marvellous, so did allegory in process of time contribute its influence towards multiplying fables and fiction almost *in infinitum*. The latent import of the allegorical doctrines being in a few ages lost and obliterated, what was originally a moral or theological tenet assumed the air and habit of a personal adventure.

Propensity to personification a source of eastern mythology. The propensity towards personification, almost universal among the orientals, was another fruitful source of fable and allegory. That the people of the East were strongly inclined to personify inanimate objects and abstract ideas, we imagine will be readily granted, when it is considered, that in the formation of language they have generally annexed the affection of sex to those objects. Hence the distinction of grammatical genders, which is known to have originated in the eastern parts of the world. The practice of personifying virtues, vices, religious and moral affections, was necessary to support that allegorical style which universally prevailed in those countries. This mode of writing was in high reputation even in Europe some centuries ago; and to it we are indebted for some of the most noble poetical compositions now extant in our own language. Those productions, however, are but faint imitations of the original mode of writing still current among the eastern nations. The Europeans derived this species of composition from the Moorish inhabitants of Spain, who imported it from Arabia, their original country.

The effects of hieroglyphic writing on mythology. The general use of hieroglyphics in the East must have contributed largely towards extending the empire of mythology. As the import of the figures employed in this method of delineating the signs of ideas was in a great measure arbitrary, mistakes must have frequently been committed in ascertaining the notions which they were at

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the first intended to represent.[1] When the development of these arbitrary signs happened to be attended with uncommon difficulty, the expounders were obliged to have recourse to conjecture. Those conjectural expositions were for the most part tinctured with that bias towards the marvellous which universally prevailed amongst the primitive men. This, we find, is the case even at this day, when moderns attempt to develope the purport of emblematical figures preserved on ancient medals, entaglios, and the like.

The wise men of the East delighted in obscure enigmatical sentences. They seem to have disdained every sentiment obvious to vulgar apprehension. The words of the wise, and their dark sayings, often occur in the most ancient records, both sacred and profane. The sages of antiquity used to vie with each other for the prize of superior wisdom, by propounding riddles, and dark and mysterious questions, as subjects of investigation. The contest between Solomon and Hiram, and that between Amasis king of Egypt and Polycrates tyrant of Samos, are universally known. As the import of those enigmatical propositions was often absolutely lost, in ages when the art of writing was little known, and still less practised, nothing remained but fancy and conjecture, which always verged towards the regions of fable. This, then, we think, was another source of mythology.

Mythology reduced to a kind of system in Egypt.

The Pagan priests, especially in Egypt, were probably the first who reduced mythology to a kind of system. The sacerdotal tribe, amongst that people, were the grand depositories of learning as well as of religion. That order of men monopolized all the arts and sciences. They seem to have formed a conspiracy among themselves, to preclude the laity from all the avenues of intellectual improvement. This plan was adopted with a view to keep the laity in subjection, and to enhance their own importance. To accomplish this end, they contrived to perform all the ministrations of their religion in an unknown tongue, and to cover them with a thick veil of fable and allegory. The language of Ethiopia became their sacred dialect, and hieroglyphics their sacred character.[2] Egypt, of course, became a kind of fairy land, where all was jugglery, magic, and enchantment. The initiated alone were admitted to the knowledge of the occult mystical exhibitions, which, in their hands, constituted the essence of their religion. From these the vulgar and profane were prohibited by the most rigorous penalties. (See MYSTERIES.) The Egyptians, and indeed all the ancients without exception, deemed the mysteries of religion too sacred and solemn to be communicated to the herd of mankind, naked and unreserved; a mode by which they imagined those sacred and sublime oracles would have been defiled and degraded. "Procul, O procul este profani:" "Odi profanum vulgus et arceo." Egypt was the land of graven images; allegory and mythology were the veil which concealed religion from the eyes of the vulgar; and fable was the groundwork of that impenetrable covering.

In the earliest ages of the world mythology had no existence.

In the earliest and most unpolished stage of society we cannot suppose fable to have existed amongst men. Fables are always *tales of other times*, but at this period other times did not reach far enough backward to afford those fruits of the imagination sufficient time to arrive at maturity. Fable requires a considerable space of time to acquire credibility, and to rise into reputation. Accordingly, we find that both the Chinese and Egyptians, the two most ancient nations whose annals have reached our times, were altogether unacquainted with fabulous details in the most early and least improved periods of their respective monarchies. It has been shown almost to a demonstration, by a variety of learned men, that both the one and the other people, during some centuries after the general deluge, retained and practised the primitive Noachic religion, in which fable and fancy could find no place; all was genuine unsophisticated truth.

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Fabulous cosmogony, the first mythological details.

As soon as the authentic tradition concerning the origin of the universe was either in a good measure lost, or at least adulterated by the invention of men, fable and fiction began to prevail. The Egyptian Thoth, Thyoth, or Mercury Trismegistus, and Moschus the Phœnician, undertook to account for the formation and arrangement of the universe, upon principles purely mechanical. Here fable began to usurp the place of genuine historical truth. Accordingly, we find that all the historians of antiquity who have undertaken to give a general detail of the affairs of the world, have ushered in their narration with a fabulous cosmogony. Here imagination ranged unconfined over the boundless extent of the primary chaos. To be convinced of the truth of this assertion, we need only look into Sanchoniathon's Cosmogony, Eusebius (*Præp. Evang.* l. 1), and Diodorus Siculus. From this we suppose it will follow, that the first race of fables owed their birth to the erroneous opinions of the formation of the universe.

Having now endeavoured to point out the origin of mythology, or fabulous traditions, we shall proceed to lay before our readers a brief detail of the mythology of the most respectable nations of antiquity, following the natural order of their situation.

Chinese mythology.

The Chinese, if any credit be due to their own annals, or to the missionaries of the church of Rome, who pretend to have copied from them, were the first of the nations. Their fabulous records reach upwards many myriads of years before the Mosaic era of the creation. The events during that period of time, if any had been recorded, must have been fabulous as the period itself. These, however, are buried in eternal oblivion. The missionaries, who are the only sources of our information with relation to the earliest periods of the Chinese history, represent those people as having retained the religion of Noah many centuries after the foundation of their empire. Upon this supposition, their cosmogony must have been sound and genuine, without the least tincture of those fabulous ingredients which have both disguised and disgraced the cosmogonies of most other nations.

Birth and inventions of Fohi.

According to the most authentic accounts, Fohe or Fohi laid the foundation of that empire about four thousand years ago. This emperor, according to the Chinese, was conceived in a miraculous manner. His mother, say they, one day as she was walking in a desert place, was surrounded by a rainbow; and, being impregnated by this meteor, was in due time delivered of that celebrated legislator. This personage, like the Athenian Cecrops, was half a man

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[1] This, though plausible enough as a mere supposition or hypothesis, must be taken with more than grains of allowance, seeing it proceeds upon an assumption which is by no means correct in point of fact. It is not true that the *import* of the figures employed in the hieroglyphic delineation of ideas was "*in a great measure arbitrary*;" for, if this had been the case, then the interpretation of such figures would have been, in the same measure or proportion, impossible. *Originally*, no doubt, *arbitrary* values may have been affixed to certain figures or symbols, that is, values not depending on any obvious analogy or principle; but these being *once* conventionally settled, remained *invariable*, and were ever afterwards employed in an uniform sense or acceptation, as much so indeed as if they had been originally *natural* instead of *conventional* signs, expressive of certain ideas. This distinction should never be lost sight of in any observations on hieroglyphical writing, which, in truth, was but ill understood at the period when the above article was composed by its able and ingenious author. If constructed on any other principle than that now stated, it would have been altogether unintelligible.—*Editor*.

[2] The modern doctrine on this subject may be ascertained by consulting the article HIEROGLYPHICS.

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and half a serpent. His intellectual powers were truly hyperbolical. In one day he discovered fifty different species of poisonous herbs. He taught his countrymen the whole art of agriculture in the space of a very few years. He instructed them how to sow five different sorts of grain. He invented boats, and nets for fishing, the art of fabricating porcelain, the management of silk-worms, the manufacturing of silk, &c. In a word, that wonderful personage was inspired by Heaven with knowledge, which qualified him for composing that incomparable body of laws which are even at this day the wonder of the world. Our readers will admit, that this whole detail is fabulous and chimerical. The most learned part of them will readily observe, that the Chinese, in ascribing the invention of all the useful arts to their Fohi, are perfectly agreed with almost all the other nations of antiquity. The Indians ascribe every invention to Budha, or Vishnu, or Foe; the Persians to Zerdusht or Zoroaster; the Chaldeans to their man of the sea, whom they call Oannes; the Egyptians to Thoth or Thyoth; the Phœnicians to Melicerta; the Greeks to the family of the Titans; and the Scandinavians to Odin.

Miraculous birth of Confucius.

About 551 years before the Christian era, appeared the famous Chinese philosopher *Con-fu-tse* or Confucius. Concerning the birth of this prince of philosophers, the Chinese have propagated the following legendary tale. His mother, walking in a solitary place, was impregnated by the vivifying influence of the heavens. The babe, thus produced, spake and reasoned as soon as it was born. Confucius, however, wrought no miracles, performed no romantic exploits, but lived an austere ascetic life, taught and inculcated the doctrines of pure morality, and died, remarkable only for superior wisdom, religious, moral, and political.

Lao-kiun and his doctrines.

About the year of Christ 601, flourished the sectary *Lao-kiun*. His mother carried him thirty years in her womb, and was at last delivered of him under a plum-tree. This philosopher was the Epicurus of the Chinese. His disciples, who were denominated the *Fao-sse*, that is, heavenly doctors, were the first who corrupted the religion of the Chinese. They were addicted to magic, and introduced the worship of good and bad demons. Their doctrine was embraced by a long succession of emperors. One of these princes, called *You-ti*, had been deprived by death of a favourite mistress, whom he loved with the most extravagant passion. The emperor, by the magical skill of one of these doctors, obtained an interview with his deceased mistress, a circumstance which riveted the whole order in the affection and esteem of the deluded prince. Here our readers will observe the exact counterpart of the fable of Eurydice, so famous in the mythology of the Greeks and Romans. That such a system of religious principles must have abounded with mythological adventures is highly probable; but as the missionaries, to whom we are chiefly indebted for our information relating to the religion of the Chinese, have not taken the pains to record them, we find it impossible to gratify the curiosity of our readers on that head.

Introduction of the worship of Fo.

The worship of the idol Fo, or Foe, was transplanted from India into China about the fifty-sixth year of the Christian era, upon the following occasion. One of the doctors of the Fao-sse had promised a prince of the family of Tchou, and brother of the Emperor Ming-ti, to make him enter into communion with the spirits. At his solicitation an ambassador was despatched into India, in order to inquire where the true religion was to be found. There had been a tradition, say the missionaries, ever since the age of Confucius, that the true religion was to be found in the West. The ambassador stopt short in India; and finding that the god Fo was in high reputation in that country, he collected several images of that deity painted on chintz, and with it forty-two chapters of the canonical books of the Hindus, which, together with the images, he laid on a white elephant, and transported into his native country. At the same time he imported from the same quarter the doctrine of the transmigration of souls, which is firmly believed in China to this day. The doctrine and worship of Fo, thus introduced, made a most rapid progress all over China, Japan, Siam, &c. The priests of Fo are called amongst the Siamese *Talapoins;* by the Tartars, *Lamas;* by the Chinese, *Ha-chang;* and by the people of Japan, *Bonzes*. By this last appellation they are generally known in Europe.

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The worshippers of Fo great mythologists.

An infinitude of fables was invented and propagated by the disciples of Fo, concerning the life and adventures of their master. If the earlier ages of the Chinese history are barren of mythological incidents, the later periods, after the introduction of the worship of Fo, furnish an inexhaustible store of miracles, monsters, fables, intrigue, exploits, and adventures, of the most villanous complexion. Indeed, most of them are so absurd, so ridiculous, and at the same time so impious and profane, that we are convinced our readers will easily dispense with a detail from which they could reap neither entertainment nor instruction. Such as may find themselves disposed to rake into this abominable puddle, we must refer to the reverend fathers Du Halde, Couplet, Amiot, Kircher, and other members of the propaganda, in whose writings they will find wherewithal to satisfy, and even to surfeit, their appetite.

Hindu mythology.

The Hindus, like the other nations of the East, for a long time retained the worship of the true God. At length, however, idolatry broke in, and, like an impetuous torrent, overwhelmed the country. First of all, the genuine history of the origin of the universe was either utterly lost, or disguised under a variety of fictions and allegories. We are told that *Brahma*, the supreme divinity of the Hindus, after three several efforts, at last succeeded in creating four persons, whom he appointed to rule over all the inferior creatures. Afterwards Brahma joined his efficient power with Bishon and Rulder, and by their united exertions they produced ten men, whose general appellation is *Munies*, that is, the inspired. The same being, according to another mythology, produced four other persons, as imaginary as the former; one from his breast, one from his back, one from his lip, and one from his heart. These children were denominated *Bangs*, the import of which word we cannot pretend to determine. According to another tradition, Brahma produced the Brahmins from his mouth, to pray, to read, to instruct; the Chiltern from his arms, to draw the bow, to fight, to govern; the Bice from his belly or thighs, to nourish, to provide the necessaries of life by agriculture and commerce; the Soder from his feet, for subjection, to serve, to labour, to travel. The reader will see at once, in these allegorical persons, the four castes or septs into which the Hindu nations have, from time immemorial, been divided. These are some of their most celebrated mythological traditions with relation to the origin of the universe.

Hindu traditions relating to the deluge.

The Hindus have likewise some mythological opinions which seem to relate to the general deluge. They tell us, that desiring the preservation of herds and of brahmans, of genii and of virtuous men, of *vedas* of law, and of precious things, the lord of the universe assumes many bodily shapes; but though he pervades, like the air, a variety of beings, yet he is himself unvaried, since he has no quality in him subject to change. At the close of the last *calpa*, there was a general destruction, occasioned by the sleep of Brahm, whence his creatures in different worlds were drowned in a vast ocean. Brahm being inclined to slumber after a lapse of so many ages, the strong demon *Hyagri-va* came near him, and stole the *vedas* which had flowed from his lips. When *Heri*, the preserver of the universe, discovered this deed of the prince of *Dainavas*, he

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took the shape of a minute fish called *Sap-hari*. After various transformations, and an enormous increase of size in each of them, the lord of the universe, loving the righteous man,[1] who had still adhered to him under all these various shapes, and, intending to preserve him from the sea of destruction caused by the depravity of the age, thus told him how he was to act: "In seven days from the present time, O thou tamer of enemies, the three worlds will be plunged in an ocean of death; but in the midst of the destroying waves a large vessel sent me for thy use shall stand before thee." The remaining part of the mythology so nearly resembles the Mosaic history of Noah and the general deluge, that the former may be a strong confirmation of the truth of the latter. To dry up the waters of the deluge, the power of the Deity descends in the form of a boar, the symbol of strength, to draw up and support on his tusks the whole earth, which had been sunk beneath the ocean. Again, the same power is represented as a tortoise sustaining the globe, which had been convulsed by the violent assaults of demons, while the gods charmed the sea with the mountain *Mandar*, and forced it to disgorge the sacred things and animals, together with the water of life, which it had swallowed. All these stories, we think, relate to the same event, shadowed by a moral, a metaphysical and an astronomical allegory; and all three seem connected with the hieroglyphical sculptures of the old Egyptians.

The Hindus divide the duration of the world into four *yugs* or *jugs*, or *jogues*, each consisting of a prodigious number of years. In each of those periods the age and stature of the human race have been gradually diminished; and in each of them mankind has gradually declined in virtue and piety, as well as in age and stature. The present period they call the *collæ*, that is, the corrupt yug, which they say is to last four hundred thousand years, of which near five thousand years are already past. In the last part of the preceding yugs, which they call the *dwa paar*, the age of man was contracted into a thousand years, as in the present it is confined to a hundred. From this proportional diminution of the length of human life, our readers will probably infer, that the two last yugs bear a pretty near resemblance to the Mosaic history of the age of the antediluvian and postdiluvian patriarchs; and that the two first are imaginary periods prior to the creation of the world, like those of the Chinese, Chaldeans, and Egyptians.

The world subject to various dissolutions and resuscitations.

According to the mythology of the Hindus, the system of the world is subject to various dissolutions and resuscitations. At the conclusion of the collæ jogue, say they, a grand revolution will take place, when the solar system will be consumed by fire, and all the elements reduced to their original constituent atoms. Upon the back of these revolutions, Brahma, the supreme deity of the Hindus, is sometimes represented as a new-born infant, with his toe in his mouth, floating on a camala or water flower, sometimes only on a leaf of that plant, on the surface of the vast abyss. At other times he is figured as coming forth of a winding shell, and again as blowing up the mundane foam with a pipe at his mouth. Some of these emblematical figures and attitudes, our learned readers will probably observe, nearly resemble those of the ancient Egyptians.

Birth of the god Fo.

But the vulgar religion of the ancient Hindus was of a very different complexion, and opens a large field of mythological adventures. We have observed above, that the Fo or Foh of the Chinese was imported from India; and now we shall give a brief detail of the mythological origin of that divinity. We have no certain account of the birthplace of this imaginary deity. His followers relate that he was born in one of the kingdoms of India near the line, and that his father was one of that country. His mother brought him into the world by the left side, and expired soon after her delivery. At the time of her conception, she dreamed that she had swallowed a white elephant; a circumstance which is supposed to have given birth to the veneration which the kings of India have always shown for a white animal of that species. As soon as he was born, he had strength enough to stand erect without assistance. He walked abroad at seven, and, pointing with one hand to the heavens, and with the other to the earth, he cried out, "In the heavens, and on the earth, there is no one but me who deserves to be honoured." At the age of thirty, he felt himself all on a sudden filled with the divinity; and now he was metamorphosed into Fo or Pagod, according to the expression of the Hindus. He had no sooner declared himself a divinity, than he thought of propagating his doctrine, and proving his divine mission by miracles. The number of his disciples was immense; and they soon spread his dogmas over all India, and even to the higher extremities of Asia.

Doctrines of Fo derived from Egypt.

One of the principal doctrines which Fo and his disciples propagated, was the metempsychosis or transmigration of souls. This doctrine, some imagine, has given rise to the multitude of idols reverenced in every country where the worship of Fo is established. Quadrupeds, birds, reptiles, and the vilest animals, had temples erected for them; because, say they, the soul of the god, in his numerous transmigrations, may have at one time or other inhabited their bodies.

Both the doctrine of transmigration and of the worship of animals seems, however, to have been imported from Egypt into India. If the intercourse between these two countries was begun at so early a period as some very late writers have endeavoured to prove, such a supposition is by no means improbable. The doctrine of the transmigration of souls was early established among the Egyptians. It was, indeed, the only idea they formed of the soul's immortality. The worship of animals among them seems to have been still more ancient. If such an intercourse did actually exist, we may naturally suppose that colonies of Egyptian priests found their way into India, as they did afterwards into Asia Minor, Italy, and Greece. That colonies of Egyptians did actually penetrate into that country, and settle there, many centuries before the Nativity, is a fact that cannot be called in question, for reasons which the bounds prescribed us in this article will not allow us to enumerate. We shall only observe, that from the hieroglyphical representations of the Egyptian deities seem to have originated those monstrous idols which from time immemorial have been worshipped in India, China, Japan, Siam, and even in the remotest parts of Asiatic Tartary.

The incarnations of Vishnu.

Foh is often called *Budha* or *Budda*, and sometimes *Vishnu*; perhaps, indeed, he may be distinguished by many other names, according to the variety of dialects of the different nations among which his worship was established. An infinitude of fables was propagated by his disciples concerning him after his death. They pretended that their master was still alive; that he had been already born eight thousand times, and that he had successively appeared under the figure of an ape, a lion, a dragon, an elephant, a boar, &c. These were called the incarnations of Vishnu. At length he was confounded with the Supreme God; and all the titles, attributes, operations, perfections, and ensigns of the Most High were ascribed to him. Sometimes he is called Amida, and represented with the head of a dog, and worshipped as the guardian of mankind. He sometimes appears as a princely personage, issuing from the

[1] He was sovereign of the world. His name was *Mana*, or Statgavrata; and his patronymic was *Vaisvata*, or Child of the Sun.

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The enormous mass of mythological traditions which have in a manner deluged the vast continent of India would fill many volumes. We have selected the preceding articles as a specimen only, by which our readers may be qualified to judge of the rest. If they find themselves disposed to indulge their curiosity at greater length, we must refer them to Thevenot's and Hamilton's Travels, to M. Anquétil in his *Zendavesta*, Halhed's Introduction to his translation of the code of Gentoo Laws, Colonel Dow's History of Hindustan, Grose's Voyage to the East Indies, and the Asiatic Researches (vol. i. and ii.).

Persian mythology. The mythology of the Persians is, if possible, still more extravagant than that of the Hindus. It supposes the world to have been repeatedly destroyed, and repeopled by creatures of different formation, who were successively annihilated or banished for their disobedience to the Supreme Being. The monstrous griffin *Sinergh* informs the hero *Caherman* that she had already lived to see the earth seven times filled with creatures, and seven times a perfect void; that before the creation of Adam, this globe was inhabited by a race of beings called *Peris* and *Dives*, whose characters formed a perfect contrast. The Peris are described as beautiful and benevolent; the Dives as deformed, malevolent, and mischievous, differing from infernal demons only in this, that they are not as yet confined to the pit of hell. They are for ever ranging over the world, to scatter discord and misery amongst the sons of men. The Peris nearly resemble the fairies of Europe; and perhaps the Dives gave birth to the giants and magicians of the middle ages. The Peris and Dives wage incessant wars; and when the Dives make any of the Peris prisoners, they shut them up in iron cages, and hang them on the highest trees, to expose them to public view, and to the fury of every chilling blast.

When the Peris are in danger of being overpowered by their foes, they solicit the assistance of some mortal hero, which produces a series of mythological adventures highly ornamental to the strains of the Persian bards, and which at the same time furnishes an inexhaustible fund of the most diversified machinery.

One of the most celebrated adventurers in the mythology of Persia is *Tahmuras*, one of their most ancient monarchs. This prince performs a variety of exploits while he endeavours to recover the fairy Merjan. He attacks the Dive Demrush in his own cave, where, having vanquished the giant or demon, he finds vast piles of hoarded wealth, which he carries off with the fair captive. The battles, labours, and adventures of Rostan, another Persian worthy, who lived many ages after the former, are celebrated by the Persian bards with the same extravagance of hyperbole with which the labours of Hercules have been sung by the poets of Greece and Rome.

Persia the birth-place of chivalry and romance. The adventures of the Persian heroes breathe all the wildness of achievement recorded of the knights of Gothic romance. The doctrine of enchantments, transformations, and the like, exhibited in both, is a characteristic symptom of one common original. Persia is the genuine classic ground of eastern mythology, and the source of the ideas of chivalry and romance, which were thence propagated to the regions of Scandinavia, and indeed to the remotest corners of Europe towards the west.

Perhaps our readers may be inclined to adopt our opinion, when we offer it as a conjecture, that the tales of the war of the Peris and Dives originated from a vague tradition concerning good and bad angels. Nor is it, we think, at all improbable, that the fable of the wars between the gods and giants, so famous in the mythology of Greece and Italy, was imported into the former of these countries from the same quarter. (For a more particular account of the Persian mythology, our readers may consult Dr Hyde, *Relig. Vet. Pers.*; D'Herbelot's *Bibl. Orient.*; and Richardson's Introduction to his Persian and Arabic Dictionary.) Mythology.

Chaldæan mythology. The mythology of the Chaldæans, like that of the other nations of the East, commences at a period myriads of years prior to the era of the Mosaic creation. Their cosmogony, exhibited by Berosus, who was a priest of Belus, and deeply versed in the antiquities of his country, is a piece of mythology of the most extravagant nature. It has been copied by Eusebius (*Chron.* lib. i. p. 5); and it is likewise to be found in Syncellus, copied from Alexander Polyhistor. According to this historian, there were at Babylon written records preserved with the greatest care, comprehending a period of fifteen myriads of years. Those writings likewise contained a history of the heavens and the sea, of the earth, and of the origin of mankind. "In the beginning," says Berosus, copying from Oannes, of whom we shall afterwards give a brief account, "there was nothing but darkness and an abyss of water, wherein resided most hideous beings produced from a twofold principle. Men appeared with two wings; some with two and some with four faces. They had one body, but two heads; the one of a man, the other of a woman. Other human figures were to be seen, furnished with the legs and horns of goats. Some had the feet of horses behind, but before were fashioned like men, resembling hippocentaurs." The remaining part of this mythology is much of the same complexion; indeed so extravagant, that we imagine our readers will readily enough dispense with our translating the sequel. "Of all these," says the author, "were preserved delineations in the temple of Belus at Babylon. The person who was supposed to preside over them was called *Omorea*. This word, in the Chaldean language, is *Thalath*, which the Greeks call Θαλασσα, but it more properly imports the moon. Matters being in this situation, *their* god, says Eusebius, *the* god, says Syncellus, came and cut the woman asunder; and out of one half of her he formed the earth, and out of the other he made the heavens; and, at the same time, he destroyed the monsters of the abyss." This whole mythology is an allegorical history copied from hieroglyphical representations, the real purport of which could not be deciphered by the author. Such, in general, were the consequences of the hieroglyphical style of writing.

Oannes the legislator of the Chaldæans. Oannes, the great civilizer and legislator of the Chaldæans, according to Apollodorus, who copied from Berosus, was an amphibious animal of a heterogeneous appearance. He was endowed with reason, and a very uncommon acuteness of parts. His whole body resembled a fish. Under the head of a fish he had also another head, and feet below similar to those of a man, which were subjoined to the tail of the fish. His voice and language were articulate, and perfectly intelligible; and there was a figure of him still extant in the days of Berosus. He made his appearance in the Erythrean or Red Sea, where it borders upon Babylonia. This monstrous being conversed with men by day; but at night he plunged into the sea, and remained concealed in the water till next morning. He taught the Babylonians the use of letters, and the knowledge of all the arts and sciences. He instructed them in the method of building houses, constructing temples, and all other edifices. He taught them to compile laws and religious ceremonies, and explained to them the principles of mathematics, geometry, and astronomy. In a word, he communicated to them every thing necessary, useful, and ornamental; and so universal were his instructions, that not

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one single article had ever been added to them since the time they were first communicated. Helladius is of opinion that this strange personage, whoever he was, came to be represented under the figure of a fish, not because he was actually believed to be such, but because he was clothed with the skin of a seal. By this account our readers will see that the Babylonian Oannes is the exact counterpart of the Fohi of the Chinese, and the Thoth or Mercury Trismegistus of the Egyptians. It is likewise apparent that the idea of the monster compounded of the man and the fish has originated from some hieroglyphic emblem of that form grafted upon the appearance of man. Some modern mythologists have been of opinion that Oannes was actually Noah, the great preacher of righteousness, who, as some think, settled in Shinar or Chaldæa after the deluge, and who, in consequence of his connection with that event, might be properly represented under the emblem of the Man of the Sea.

The nativity of Venus, the goddess of beauty and love, is another piece of mythology famous amongst the Babylonians and Assyrians. An egg, say they, of a prodigious size, dropped from heaven into the river Euphrates. Some doves settled upon this egg, after the fishes had rolled it to the bank. In a short time this egg produced Venus, who was afterwards called *Dea Syria*, or the Syrian goddess. In consequence of this tradition, says Hyginus, pigeons and fishes became sacred to this goddess amongst the Syrians, who always abstained from eating the one or the other. Of this imaginary being we have a very exact and entertaining history in the treatise *De Dea Syria*, generally ascribed to Lucian.

The nativity of the goddess of beauty and love.

In this mythological tradition our readers will probably discover an allusion to the celebrated Mundane Egg; and at the same time the story of the fishes will lead them to anticipate the connection between the sea and the moon. This same deity was the Atargatis of Ascalon, described by Diodorus the Sicilian; the one half of her body being that of a woman, and the other that of a fish. This was no doubt a hieroglyphic figure of the moon, importing the influence of that planet upon the sea and the sex. The oriental name of this deity evidently points to the moon; for it is compounded of two Hebrew words,[1] importing "the queen of the host of heaven."

The fable of Semiramis is nearly connected with the preceding one. Diodorus Siculus has preserved the mythological history of this deity, which he and all the writers of antiquity have confounded with the Babylonian princess of the same name. That historian informs us, that the word *Semiramis*, in the Syrian dialect, signifies "a wild pigeon;" but we apprehend that this term was a name or epithet of the moon, as it is compounded of two words[2] of an import naturally applicable to the lunar planet. It was a general practice amongst the Orientals to denominate their sacred animals from that deity to which they were consecrated. Hence the moon being called *Semiramis*, and the pigeon being sacred to her divinity, the latter was called by the name of the former.[3]

The fable of Semiramis.

We should now proceed to notice the mythology of the Arabians, the greater part of which is, however, buried in the abyss of ages; although, when we reflect on the genius and character of that people, we must be convinced that they too, as well as the other nations of the East, abounded in fabulous relations and romantic compositions. The natives of that country have always been enthusiastically addicted to poetry, of which, in its early stage, fable is the essence. Wherever the Muses have erected their throne, fables and miracles have always appeared in their train. In the Koran we meet with frequent allusions to well-known traditionary fables. These had been transmitted from generation to generation by the bards and rhapsodists, for the entertainment of the vulgar. In Arabia, from the earliest ages, it has always been one of the favourite entertainments of the common people, to assemble in the serene evenings around their tents, or on the platforms with which their houses are generally covered, or in large halls erected for the purpose, in order to amuse themselves with traditional narrations of the most distinguished actions of their most remote ancestors. Oriental imagery always embellished their romantic details. The glow of fancy, the love of the marvellous, the propensity towards the hyperbolical and the vast, which constitute the essence of oriental description, must ever have drawn the relation aside into the devious regions of fiction and fairy land. The religion of Mahommed beat down the original fabric of idolatry and mythology together. The Arabian fables current in modern times are borrowed or imitated from Persian compositions; Persia being still the grand nursery of romance in the East.

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In Egypt we find idolatry, theology, and mythology, almost inseparably blended together. The inhabitants of this region, too, as well as of others in the vicinity of the centre of population, adhered for several centuries to the worship of the true God. At last, however, conscious of their own ignorance, impurity, imperfection, and total unfitness to approach an infinitely perfect Being, distant, as they imagined, and invisible, they began to cast about for some beings more exalted, and more perfect than themselves, by whose mediation they might prefer their prayers to the Supreme Majesty of heaven. In this state, the luminaries of heaven, which, they imagined, were animated bodies, naturally presented themselves. These were splendid and glorious beings. They were thought to partake of the divine nature; they were revered as the satraps, prefects, and representatives of the Supreme Lord of the universe. They were visible, they were beneficent; they dwelt nearer to the gods; they were obvious to the worshipper, and always accessible. These were, of course, employed as mediators and intercessors between the Supreme Divinity and his humble subjects of this lower world. Thus employed, they might claim a subordinate share of worship, which was accordingly assigned them. In process of time, however, that worship, which was originally addressed to the Supreme Creator by the mediation of the heavenly bodies, was in a great measure forgotten, and the adoration of mankind ultimately terminated upon those illustrious creatures. To this circumstance, we think, we may ascribe the origin of that species of idolatry called Tsabaism, or the worship of the host of heaven, which overspread the world early and almost universally. In Egypt this mode of worship was adopted in all its most absurd and most enthusiastic forms, and at the same time the most heterogeneous mythology appeared in its train. The mythology of the ancient Egyptians was so various and multiform, so complicated and so mysterious, that it would require many volumes even to give a superficial account of its origin and progress, not only in its mother country, but even in many other parts of the eastern and western world. Besides, the idolatry and mythology of that wonderful

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Origin of Tsabaism.

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[1] ADAR or HADAR, *magnificus*, and GAD, *exercitús*, *turmæ*.

[2] *Shem* or *Sem*, a sign, and *ramah*, high.

[3] As the bounds prescribed for the present article render it impossible for us to do justice to this interesting piece of mythology, we must beg leave to refer our readers for farther information to Diodorus Siculus, lib. ii.; Hyginus, *Poet. Astron. Fab.* 197; Pharnutus, *de Nat. Deor.*; Ovid, *Metam.* lib. iv.; Athen. *in Apol.*; Izetzes, chil. ix. cap. 275; Selden, *de Diis Syr.* ii. 183.

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country are so closely connected and so inseparably blended together, that it is impossible to describe the latter without at the same time developing the former. We hope, therefore, that our readers will not be disappointed, if, in an article of this nature, we touch only upon some of the leading or most interesting articles of this complicated subject.

Reign of gods and demigods in Egypt.

The Egyptians confounded the revolutions of the heavenly bodies with the reigns of their most early monarchs. Hence the incredible number of years included in the reign of their eight superior gods, who, according to them, filled the Egyptian throne successively in the most early periods of time. To these, according to their system, succeeded twelve demigods, who likewise reigned an amazing number of years. These imaginary reigns were no other than the periodical revolutions of the heavenly bodies preserved in their almanacs, which might be carried back, and actually were carried back, at pleasure. Hence the fabulous antiquity of that kingdom. The imaginary exploits and adventures of these gods and demigods furnished an inexhaustible fund of mythological romances. To the demigods succeeded the kings of the cynic cycle, personages equally chimerical with the former. The import of this epithet has greatly perplexed critics and etymologists. We apprehend that it is an oriental word importing *royal* dignity, or elevation of rank. This appellation intimated, that the monarchs of that cycle, admitting that they actually existed, were more powerful and more highly revered than their successors. After the princes of the cynic cycle came another race, denominated *Nekyes*, a title likewise implying royal, splendid, glorious. These cycles figure high in the mythological annals of the Egyptians, and have furnished materials for a variety of learned and ingenious disquisitions. The wars and adventures of Osiris, Orus, Typhon, and other allegorical personages who figure in the Egyptian rubric; the wanderings of Isis, the sister and wife of Osiris; the transformation of the gods into divers kinds of animals; their birth, education, peregrinations, and exploits; compose a body of mythological fictions so various, so complicated, so ridiculous, and often so apparently absurd, that all attempts to develope and explain them have hitherto proved unsuccessful. All, or the greater part, of those extravagant fables, were the offspring of hieroglyphical or allegorical emblems devised by the priests and sages of that nation, with a view to conceal the mysteries of their religion from that class of men whom they stigmatized with the name of the uninitiated rabble.

Worship of brute animals.

The worship of brute animals and of certain vegetables, universal amongst the Egyptians, was another exuberant source of mythological adventures. The Egyptian priests, many of whom were likewise profound philosophers, observed, or pretended to observe, a kind of analogy between the qualities of certain animals and vegetables, and those of some of their subordinate divinities. Such animals and vegetables they adopted, and consecrated to the deities to whom they were supposed to bear this analogical resemblance; and in process of time they considered them as the visible emblems of those divinities to which they were consecrated. By these the vulgar addressed their archetypes, in the same manner as, in other countries, pictures and statues were employed for the very same purpose. The mob, in process of time, forgetting the emblematical character of those brutes and vegetables, addressed their devotion immediately to them; and of course these became the ultimate objects of vulgar adoration.

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After these objects, animate or inanimate, were consecrated as the visible symbols of the deities, it soon became fashionable to make use of their figures to represent those deities to which they were consecrated. This practice was the natural consequence of the hieroglyphical style which universally prevailed amongst the ancient Egyptians. Hence Jupiter Ammon was represented under the figure of a ram, Apis under that of a cow, Osiris of a bull, Pan of a goat, Thoth or Mercury of an ibis, Bubastis or Diana of a cat. It was likewise a common practice amongst those deluded people to dignify these objects, by giving them the names of those deities which they represented. By this mode of dignifying these sacred emblems, the veneration of the rabble was considerably enhanced, and the ardour of their devotion inflamed in proportion. From these two sources, we think, are derived the fabulous transformation of the gods, so generally celebrated in the Egyptian mythology, and from it imported into Greece and Italy. In consequence of this practice, their mythological system was rendered at once enormous and unintelligible.[1]

Mercury Trismegistus the author of the Egyptian mythology

Their Thoth, or Mercury Trismegistus, was, in our opinion, the inventor of this unhappy system. This personage, according to the Egyptians, was the original author of letters, geometry, astronomy, music, and architecture; in a word, of all the elegant and useful arts, and of all the branches of science and philosophy. He it was who first discovered the analogy between the divine affections, influences, appearances, operations, and the corresponding properties, qualities, and instincts of certain animals, and the propriety of dedicating particular kinds of vegetables to the service of particular deities. The priests, whose province it was to expound the mysteries of that allegorical hieroglyphical religion (see MYSTERIES), gradually lost all knowledge of the primary import of the symbolical characters. To supply this defect, and at the same time to veil their own ignorance, the sacerdotal instructors had recourse to fable and fiction. They heaped fable upon fable, till their religion became an accumulated chaos of mythological absurdities. Two of the most learned and most acute of the ancient philosophers have attempted a rational explication of the latent import of the Egyptian mythology; but both have failed in the attempt; nor have the moderns, who have laboured in the same department, performed their part with much better success.[2]

Phœnician mythology.

The elements of Phœnician mythology have been preserved by Eusebius (*Præparat. Evang.* sub init.). In the large extract which that learned father had copied from Philo Biblius's translation of Sanchoniathon's History of Phœnicia, we are furnished with several articles of mythology. Some of these throw considerable light on several passages of the sacred history; and all of them are strictly connected with the mythology of the Greeks and Romans. There we have preserved a brief but entertaining detail of the fabulous adventures of Uranus, Cronus, Dagon, Thyoth or Mercury, probably the same with the Egyptian hero of that name. Here we find Muth or Pluto, Æphcestus or Vulcan, Æsculapius, Nereus, Poseidon or Neptune, &c. Astarte, or Venus Urania, makes a conspicuous figure in the catalogue of Phœnician worthies; Pallas or Minerva is planted upon the territory of Attica; in a word, all the branches of the family of the Titans, who in after ages

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[1] See, on this subject, Sir William Drummond's *Origines*, &c. b. iv. c. 5, vol. ii. p. 146.

Instead, therefore, of prosecuting this inexplicable subject, which would swell the present article beyond all proportion, we must beg leave to refer those who are desirous of further information, to the following authors, where they will find enough to gratify their curiosity, if not to inform their judgment:—Herodotus, lib. ii.; Diodorus Siculus, lib. i.; Plutarch, *Isis et Osiris*; Jamblichus, *de Myst. Egypt.*; Horus Apollo, *Hieroglyph. Egypt.*; Macrobius, *Saturn*, cap. 23, amongst the ancients: and, amongst the moderns, Kircher's *Œdipus*; Vossius, *de Orig. et Prog. Idol.*; Mr Bryant's *Analysis of Anc. Mythol.*; Gebelin, *Monde Primitif*; and, above all, to the learned Jablonski's *Pantheon Egyptiorum.*

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figured in the rubric of the Greeks, are brought upon the stage, and their exploits and adventures briefly detailed.

Grecian mythology derived from Egypt and Phœnicia.

By comparing this fragment with the mythology of the Atlantidæ and that of the Cretans preserved by Diodorus the Sicilian (lib. v.), we think there is good reason to conclude, that the family of the Titans, the several branches of which seem to have been both the authors and objects of a great part of the Grecian idolatry, originally emigrated from Phœnicia. This conjecture will receive additional strength, when it is considered that almost all their names recorded in the fabulous records of Greece may be easily traced up to a Phœnician original. We agree with Herodotus, that a considerable part of the idolatry of Greece may have been borrowed from the Egyptians; at the same time, we imagine it highly probable, that the idolatry of the Egyptians and Phœnicians was in its original constitution nearly the same. Both systems were Tsabiasm, or the worship of the host of heaven. The Pelasgi, according to Herodotus, learned the names of the gods from the Egyptians; but in this conjecture he is certainly warped by his partiality for that people. Had those names been imported from Egypt, they would no doubt have bewrayed their Egyptian original; whereas the skilful etymologist will be convinced that every one is of Phœnician extraction.

The adventures of Jupiter, Juno, Mercury, Apollo, Diana, Mars, Minerva or Pallas, Venus, Bacchus, Ceres, Proserpine, Pluto, Neptune, and the other descendants and coadjutors of the ambitious family of the Titans, furnish by far the greatest part of the mythology of Greece. They left Phœnicia, we think, about the age of Moses; they settled in Crete, a large and fertile island; from this region they made their way into Greece, which, according to the most authentic accounts, was at that time inhabited by a race of savages. The arts and inventions which they communicated to the natives; the mysteries of religion which they inculcated; the laws, customs, polity, and good order which they established; in short, the blessings of humanity and civilization which they everywhere disseminated, in process of time inspired the unpolished inhabitants with a kind of divine admiration. Those ambitious mortals improved this admiration into divine homage and adoration. The greater part of that worship, which had been formerly addressed to the luminaries of heaven, was now transferred to those illustrious personages. They claimed and obtained divine honours from the deluded rabble of enthusiastic Greeks. Hence sprung an inexhaustible fund of the most inconsistent and irreconcilable fictions.

Hence the inconsistent fictions of the Greek poets.

The foibles and frailties of the deified mortals were transmitted to posterity, incorporated, as it were, with the pompous attributes of supreme divinity. Hence the heterogeneous mixture of the mighty and the mean which chequers the characters of the heroes of the Iliad and Odyssey. The Greeks adopted the oriental fables, the import of which they did not understand. These they accommodated to heroes and illustrious personages, who had figured in their own country in the earliest periods. The labours of Hercules originated in Egypt, and evidently relate to the annual progress of the sun in the zodiac, though the vain-glorious Greeks accommodated them to a hero of their own, the reputed son of Jupiter and Alcmena. The expedition of Osiris they borrowed from the Egyptians, and transferred to their Bacchus, the son of Jupiter and Semele the daughter of Cadmus. The transformation and wanderings of Io are evidently transcribed from the Egyptian romance of the travels of Isis in quest of the body of Osiris, or of the Phœnician Astarte, drawn from Sanchoniathon. Io or Ioh is in reality the Egyptian name of the moon, and Astarte was the name of the same planet amongst the Phœnicians. Both these fables are allegorical representations of the anomalies of the lunar planet, or perhaps the progress of the worship of that planet in different parts of the world. The fable of the conflagration occasioned by Phaeton is clearly of oriental extraction, and alludes to an excessive drought which in the early periods of time scorched Ethiopia and the adjacent countries. The fabulous adventures of Perseus are said to have happened in the same regions, and are allegorical representations of the influence of the solar luminary; for the original Perseus was the sun. The rape of Proserpine and the wanderings of Ceres, the Eleusinian mysteries, the orgia or sacred rites of Bacchus, the rites and worship of the Cabiri, were imported from Egypt and Phœnicia, but strangely garbled and disfigured by the hierophants of Greece. The gigantomachia, or war between the gods and the giants, and all the fabulous events and varieties of that war, form an exact counterpart to the battles of the Peris and Dives, celebrated in the romantic annals of Persia.

Mythology.

The Greeks ignorant of oriental languages.

A considerable part of the mythology of the Greeks sprung from their ignorance of the oriental languages. They disdained to apply themselves to the study of languages spoken by people whom, in the pride of their heart, they stigmatized with the epithet of *barbarians*. This aversion to every foreign dialect was highly detrimental to their progress in the sciences. The same neglect or aversion has, we imagine, proved an irreparable injury to the republic of letters in all succeeding ages. The aoids, or strolling bards, laid hold on those oriental legends, which they sophisticated with their own additions and improvements, in order to accommodate them to the popular taste. These wonderful tales figured in their rhapsodical compositions, and were greedily swallowed down by the credulous vulgar. Those fictions, as they rolled down, were constantly augmented with fresh materials, till in process of time their original import was either forgotten or buried in impenetrable darkness. A multitude of these Hesiod has collected in his *Theogonia*, or Generation of the Gods, which unhappily became the religious creed of the illiterate part of the Greeks. Indeed fable was so closely interwoven with the religion of that airy, volatile people, that it seems to have contaminated not only their religious and moral, but even their political tenets.

Oracle of Dodona.

The far-famed oracle of Dodona was copied from that of Ammon at Thebes in Upper Egypt. The oracle of Apollo at Delphos was an emanation from the same source. The celebrated Apollo Pythius of the Greeks was no other than the Ob or Aub of the Egyptians, who denominated the basilisk or royal snake Ov Cai, because it was held sacred to the sun. Ob or Aub is still retained in the Coptic dialect, and is one of the many names or epithets of that luminary. In short, the groundwork of the Grecian mythology is to be traced in the East. Only a small part of it was fabricated in the country; and what was imported pure and genuine was miserably sophisticated by the hands through which it passed, in order to give it a Grecian air, and to accommodate its style to the Grecian taste. To enlarge upon this topic would be altogether superfluous, as our learned readers must be well acquainted with it already, and the unlearned may, without much trouble or expense, furnish themselves with books upon that subject.

Roman mythology borrowed from Greece.

The Roman mythology was borrowed from the Greeks. That people had addicted themselves for many centuries to the arts of war and civil polity. Science and philosophy were either neglected or unknown. At last they conquered Greece, the native land of science, and then "Græcia capta ferum victorem cepit arte et intulit agresti Latio." This being the case, their mythology was, upon the whole, a transcript from that of Greece. They had indeed gleaned a few fables from the Pelasgi and Etruscans, which, however, are of so little consequence, that they are scarcely worth the trouble of transcribing.

Mythology. The mythology of the Celtic nations is in a great measure lost. There may possibly still remain some vestiges of the druidical superstition in the remotest parts of the Highlands and Islands of Scotland, and perhaps in the uncivilized places of Ireland. These, we presume, would afford our readers but little entertainment, and still less instruction.

Mythology of the northern nations. The mythology of the northern nations, that is, of the Norwegians, Danes, Swedes, and Icelanders, is uncommonly curious and entertaining. The Edda and Voluspa contain a complete collection of fables which have not the smallest affinity with those of the Greeks and Romans. They are wholly of an oriental complexion, and seem almost congenial with the tales of the Persians above described. The Edda was compiled in Iceland in the thirteenth century. It is a kind of system of the Scandinavian mythology; and it has been reckoned, and we believe justly, a commentary on the Voluspa, which was the Bible of the northern nations. Odin or Othin, or Woden or Waden, was the supreme divinity of those people. His exploits and adventures furnish the far greater part of their mythological creed. That hero is supposed to have emigrated from the East, but from what country or at what period is not certainly known. His achievements are magnified beyond all credibility. He is represented as the god of battles, and as slaughtering thousands at a blow. His palace is called Valhalla; it is situated in the city of Midgard, where, according to the fable, the souls of heroes who had bravely fallen in battle enjoy supreme felicity. They spend the day in mimic hunting matches, or imaginary combats. At night they assemble in the palace of Valhalla, where they feast on the most delicious viands, dressed and served up by the Valkyriæ, virgins adorned with celestial charms, and flushed with the bloom of everlasting youth. They solace themselves with drinking mead out of the skulls of enemies whom they had killed in their days of nature. Mead, it seems, was the nectar of the Scandinavian heroes.

The hell and devil of the Scandinavians. Sleepner, the horse of Odin, is celebrated along with his master. Hela, the hell of the Scandinavians, affords a variety of fables equally shocking and heterogeneous. Loke, the evil genius or devil of the northern people, nearly resembles the Typhon of the Egyptians. Signa or Sinna is the consort of Loke; and from this name the English word *sin* is derived. The giants Weymur, Ferbanter, Belupher, and Hellunda, perform a variety of exploits, and are exhibited in the most frightful attitudes. One would be tempted to imagine, that they perform the exact counterpart of the giants of the Greek and Roman mythologists. Instead of glancing at these ridiculous and uninteresting fables, which is all that the limits prescribed us would permit, we shall take the liberty to lay before our readers a brief account of the contents of the Voluspa, which is indeed the text of the Scandinavian mythology.

The Voluspa. The word *Voluspa* imports, "the prophecy of Vola or Fola." This was, perhaps, a general name for the prophetic ladies of the North, as Sibyl was appropriated to women endowed with the like faculty in the South. Certain it is, that the ancients generally connected madness with the prophetic faculty. Of this we have two celebrated examples; the one in Lycophron's Cassandra, and the other in the Sibyl of the Roman poet. The word *vola* signifies "mad or foolish;" whence the English words *fool, foolish, folly*. *Spa*, the latter part of the composition, signifies "to prophecy," and is still current amongst the common people in Scotland, in the word *spae*, which has nearly the same signification.

The Voluspa consists of between two and three hundred lines. The prophetess having imposed silence on all intelligent beings, declares that she is about to reveal the works of the Father of nature, the actions and operations of the gods, which no mortal ever knew before herself. She then begins with a description of the chaos; and then proceeds to the formation of the world, and the creation of the different species of its inhabitants, giants, men, and dwarfs. She then explains the employments of the fairies or destinies, whom the northern people call *nornies*, the functions of the deities, their most memorable adventures, their disputes with Loke, and the vengeance which ensued. She at last concludes with a long, and indeed animated description of the final state of the universe, and its dissolution by a general conflagration. In this catastrophe, Odin, and all the rabble of the Pagan divinities, are to be confounded in the general ruin, no more to appear on the stage of the universe; and out of the ruins of the former world, according to the Voluspa, a new one shall spring up, arrayed in all the bloom of celestial beauty.

Mythology.

Such is the doctrine exhibited in the fabulous Voluspa. So congenial are some of the details therein delivered, especially those relating to the final dissolution of the present system, and the succession of a new heaven and a new earth, that we find ourselves strongly inclined to suspect, that the original fabricator of the work was a semi-pagan writer, much of the same complexion with the authors of the Sibylline oracles, and of some other apocryphal pieces which appeared in the world during the first ages of Christianity.

Mythology of Mexico and Peru. In America, the only mythological countries seems to be Mexico and Peru. The other parts of that large continent were originally inhabited by savages, most of them as remote from religion as from civilization. The two vast empires of Mexico and Peru had existed about four hundred years only before the Spanish invasion; but in neither of them was the use of letters understood; and of course the ancient opinions of the natives relating to the origin of the universe, the changes which succeeded, and every other monument of antiquity, were obliterated and lost. Clavigero has indeed enumerated a crowd of sanguinary gods worshipped by the Mexicans; but he produces nothing either entertaining or interesting with respect to their mythology. Humboldt has gone deeper into the subject, and produced much information that is equally curious and instructive; whilst subsequent travellers, following his example, and extending their inquiries and researches, have thrown new light on both the mythology and antiquities of Mexico. See Mexico.

The only remarkable piece of mythology in the annals of the Peruvians, is the pretended extraction of Manco Capec the first inca of Peru, and of Mama Ocolla his consort. These two illustrious personages appeared first on the banks of the lake Titicaca. They were persons of a majestic stature, and were clothed in decent garments. They declared themselves to be the children of the Sun, sent by their beneficent parent, who beheld with pity the miseries of the human race, to instruct and to reclaim them. Thus we find that these two legislators availed themselves of a pretence which had often been employed in more civilized regions for the very same purposes. The idolatry of Peru was gentle and beneficent, that of Mexico gloomy and sanguinary. The principle of good predominated in the one, the principle of evil in the other. The former borrowed its complexion from the character of its founders; the latter assumed the dark and repulsive aspect of the tyranny which it was intended to cement and consolidate. In a word, the idolatry of Mexico stood to the idolatry of Peru in a relation somewhat analogous to that which the wild and savage superstitions of the northern nations bore to the more refined and graceful mythology of Greece and of Rome.

In the course of this article, we have not much enlarged upon the mythology of the Greeks and Romans; that subject we conceive to be so universally known by the learn-

Mzensk ‖ Naas.

ed, and so little valued by others, that a minute discussion of it would be altogether superfluous. We flatter ourselves, however, that in the course of this disquisition we have thrown out some reflections and observations which may perhaps prove more acceptable to both descriptions of readers, and serve to direct their attention to a subject which is yet far from being exhausted. (o. o. o. o.)

Nabatene ‖ Nabis.

MZENSK, a circle of the Russian province of Orel, extending in north latitude from 53. 8. to 53. 39. and in east longitude from 36. 24. to 37. 3. The capital is a city of the same name, 696 miles distant from St Petersburg, and situated on the river Sudsha. It contains twelve churches, 1100 houses, and 6400 inhabitants, who subsist chiefly by dealing in the produce of the soil. It is situated in latitude 53. 17. N. and longitude 35. 28. E.

N.

N, A liquid consonant, and the thirteenth letter of the Greek, Latin, and English alphabets.

The *n* is a nasal consonant, its sound being that of a *d*, passed through the nose; so that when the nose is stopped by a cold, or the like, it is usual to pronounce *d* for *n*. The Abbé de Dangeau observes, that in the French, the *n* is frequently a mere nasal vowel, without any thing of the consonant in it. He calls it the Sclavonic vowel. The Hebrews call their corresponding letter *nun*, which signifies child, as being supposed the offspring of *m*; partly from the resemblance of sound, and partly from the similarity of the figure. Thus, from the *m*, by omitting the last column, is formed *n*; and from the capital N, by omitting the first column, is formed the Greek minuscle ν. Hence, for *biennies* the Latins frequently use *bimus*; and the same people converted the Greek ν, at the end of a word, into an *m*, as φαρμακον, *pharmacum*.

N before *p*, *b*, and *m*, the Latins change into *m*, and frequently into *l* and *r*, as in *inludo*, *illudo*; *inrigo*, *irrigo*; in which they agree with the Hebrews, who instead of *nun* frequently double the following consonants. The Greeks do the same, as when for *Manlius* they write Μαλλιος; and before λ, γ, χ, ν, they changed the ν into γ; in which they were followed by the ancient Romans, who for *Angulus* wrote *Aggulus*, for *anceps*, *agceps*, and so of others. The Latins retrench the *n* from Greek nouns ending in ων, as Λεων, *Leo*, Δρακων, *Draco*; but, on the contrary, the Greeks add it to the Latin ones ending in *o*, as Κατων, Νερων, *Cato*, *Nero*.

N, amongst the ancients, was a numeral letter, signifying 900; according to the verse in Baronius,

N, quoque nongentos numero designat habendos:

And when a line was placed over it, $\overline{N}$, it signified nine thousand. Amongst the ancient lawyers, *N. L.* stood for *non liquet*, that is, the cause is not clear enough to pass sentence upon. N, or N°, in commerce, is used as an abbreviation of *numero*, number.

NAAS, a borough town of Ireland, in the county of Kildare. It was anciently the residence of the kings of Leinster. A charter granted by Henry V. establishes beyond controversy the fact of the existence of the corporation as long ago as the year 1414. Its name signifies "the place of elders;" for here the states of the province of Leinster assembled during the sixth, seventh, and eighth centuries, after the Naasteighan of Carmen had been anathematized by the Christian clergy. On the arrival of the English it was fortified; many castles were erected, portions of the ruins of which are still visible; and parliaments were held there. Originally extensive possessions belonged to the town; but these the members of the corporation, one of the most exclusive in Ireland, have from time to time conveyed to themselves or their friends at rentals merely nominal; and great poverty exists in the district. Naas is distant about fifteen miles south-west from Dublin, with which it has a water communication by means of a branch of the Grand Canal; and it is the first considerable town from the metropolis on the great southern road; yet with these local advantages it presents a poor and neglected appearance. The corporation do not support any institution for relief of the poor, and there is no public school or other charitable foundation under their superintendence; but there is a diocesan school established under act of parliament, and there are Sunday and other schools for gratuitous education. There are markets which are held on every Monday, Thursday, and Saturday. The corn-market is very extensive. The town contains about fifty houses of the value of L.10 a year and upwards. According to the return of 1821, the population of the town was 3073; but in 1831 it was 3808, of whom 1755 were males, and 2053 females; the families were 743; houses inhabited, 573; uninhabited, twenty-five; building, six.

NABATENE, or Regio Nabatæorum, according to Jerome, comprehended all the country lying between the Euphrates and the Red Sea, and thus contained Arabia Deserta, with a part of Arabia Petræa. It was so called from Nabaioth, the first-born of Ismael. According to Diodorus, it was situated between Syria and Egypt.

NABIS, tyrant of Sparta, reigned about 204 years before Christ, and is reported to have so far exceeded all other tyrants, that, upon comparison, he left the epithets of *gracious* and *merciful* to Dionysius and Phalaris. He is said to have contrived an instrument of torture in the form of a statue of a beautiful woman, whose rich dress concealed a number of iron spikes in her bosom and arms. When any one therefore opposed his demands, he would say, "If I have not talents enough to prevail with you, perhaps my woman Apega may persuade you." Then appeared the statue, which Nabis, taking by the hand, led up to the person, who, being embraced by it, was thus tortured into compliance. To render his tyranny less unpopular, Nabis formed an alliance with Flaminius the Roman general, and pursued, with the most inveterate enmity, the war which he had undertaken against the Achæans. He

Nablum ‖ Nachelo.

besieged Gythium, and defeated Philopœmen in a naval engagement. But his triumph was short; the general of the Achæans soon repaired his losses; and Nabis having been defeated in an engagement, was killed as he attempted to save his life by flight, about 194 years before the Christian era.

NABLUM, in Hebrew *Nebel*, was an instrument of music amongst the Jews. It had strings like the harp, was played upon by both hands, and in form resembled that of a Greek A. In the Septuagint and Vulgate it is called *noblum*, *psalterion*, *lyra*, and sometimes *cithara*.

NABO, or NEBO, in *Mythology*, a deity of the Babylonians, who possessed the next rank to Bel or Belus. Vossius apprehends that Nabo was the moon, and Bel the sun; but Grotius supposes that Nabo was some celebrated prophet of the country; and this opinion is confirmed by the etymology of the name, signifying, according to Jerome, "one who presides over prophecy."

NABOB, properly NAWAB, the plural of *Naib*, a deputy. As used in Bengal, this title is the same as Nazim.

NABONASSAR, first king of the Chaldæans or Babylonians, memorable on account of the Jewish era which bears his name, and which is generally fixed in 3257, beginning on Wednesday, February 26th, in the 3967th of the Julian period, 747 years before Christ. The Babylonians having revolted from the Medes, who had overthrown the Assyrian monarchy, founded under Nabonassar a dominion which was much increased under Nabuchadnezzar. It is probable, that this Nabonassar is the Baladan mentioned in the second of Kings (xx. 12), father of Merodach, who sent ambassadors to Hezekiah.

NABOPOLASSAR, king of Babylon, who joined with Astyages the Mede, to destroy the empire of Assyria; which having accomplished, they founded the two empires of the Medes under Astyages, and the Chaldæans under Nabopolassar, 627 years before Christ.

NABUCHADNEZZAR, or NABUCHADONOSOR II. king of Assyria, son of Nabopolassar, and styled the Great, was associated with his father in the empire, 607 years before Christ. The following year he took Jehoiakim king of Judah prisoner, and proposed to carry him and his subjects in captivity into Babylon; but upon his submission, and promising to hold his kingdom under Nabuchadonosor, he was permitted to remain at Jerusalem. About 603 years before Christ, Jehoiakim attempted to shake off the Assyrian yoke, but without success; and this revolt brought on the general captivity. Nabuchadnezzar having subdued the Ethiopians, Arabians, Idumæans, Philistines, Syrians, Persians, Medes, Assyrians, and almost all Asia, and being puffed up with pride, caused a golden statue to be set up, and commanded all to worship it; but Daniel and his companions having refused to do so, they were cast into the fiery furnace. As Nabuchadnezzar was admiring his own magnificence, he was, by divine sentence, driven from men, and in the Scripture style is said to have eaten grass as an ox, that is, he was seized with the disease called by the Greeks *liconthropy*, which is a kind of madness that causes persons to run into the fields and streets in the night, and sometimes to suppose themselves to have the heads of oxen, or to be made of glass. At the end of seven years his reason returned to him, and he was restored to his throne and his glory. He died 562 B. C. in the forty-third year of his reign; in the fifth of which happened that eclipse of the sun mentioned by Ptolemy, which is the surest foundation of the chronology of his reign.

NACHELO, or NAKHILO, a sea-port of Persia, in Laristan, defended by a square fort, flanked by four towers. It is situated at the mouth of a river which falls into the Persian Gulf, where the anchorage would be good if it were not exposed to the north-west winds. This place was for a time under the dominion of the Wahabees, during the prevalence of their power. There is a fishery of pearls in the neighbourhood. It is fifty miles south-south-west of Lar.

Nachitschevan ‖ Nævius.

NACHITSCHEVAN, a city of Russia in Europe, in the eastern division of the circle of Rostow, in the province of Katerinoslaw. It stands on the river Don, which here frequently overflows its banks. Its inhabitants are almost exclusively of the Armenian race and religion; and, by their eastern costume and manners, they are in a great measure kept separate from the Russians. The city contains 2400 houses, and about 14,000 inhabitants. In their eastern way they produce much silk, having planted more than 20,000 mulberry trees. They also grow much hemp and flax; make linen, cotton, and silk goods; and have iron-works, soap-works, and numerous distilleries. These people were brought from the Crimea.

NACKSHIEVAN, or NUCKSHIEVAN, a town of Persian Armenia, formerly one of the most magnificent cities of Persia, supposed to have been the ancient *Artaxata*, now only famous for its magnificent ruins, and containing not above 400 inhabitants. Its ruin was completed by Abbas I. who, in the plenitude of his tyrannical power, removed the inhabitants by force into the interior. It is eighty-five miles south-east of Erivan.

NADED, a town in the south of India, situated on the Cavery River, 100 miles above Hyderabad. It is celebrated as the burial-place of Gooroo Govend, the Sikh high-priest, who died A. D. 1708.

NADEGADOO, a well-watered district on the east side of the island of Ceylon, through which runs the Singepetto River. It lies between the seventh and eighth degrees of N. lat. and produces chiefly cinnamon and rice.

NADIM, a river of Asiatic Russia, which rises in Lake Toromlar, and falls into the Gulf of Obi. There is a small town of the name of Nadimskoi at its mouth. Long. 73. 44. E. Lat. 66. 25. N.

NADIR, in *Astronomy*, that point of the heavens which is diametrically opposite to the zenith or point directly above our heads.

NADONE, or NADOUN, a town of Hindustan, in the province of Lahore, being the principal one of the Kangrah country, is situated on the eastern bank of the Beyah river. This place was considered as a respectable fortress in the year 1014, and was taken from the Hindus by Sultan Mahmoud of Ghizni. The Nadone district borders on the Punjab. It is mountainous, and is governed by a Hindu prince, tributary to the Sikhs, who was plundered by the rajah of Nepaul's army. Long. of the town 75. 47. E. Lat. 31. 59. N.

NÆNIA, the goddess of funerals at Rome. Her temple was without the gates of the city. The songs which were sung at funerals were also called *nænia*. They were generally filled with the praises of the deceased; but sometimes they were so unmeaning and improper, that the word became proverbial to signify nonsense.

NAERDEN, a strong town of Holland, situated at the head of the canals of the province. The foundations of it were laid by William of Bavaria, in 1350. It was taken by the Spaniards in 1572, and by the French in 1672; but it was retaken by the Prince of Orange the next year. It stands at the south end of the Zuyder Zee, in long. 5. 3. E. and lat. 51. 22. N.

NÆVIUS, CNEIUS, a tragic and comic poet, was a native of Campania, and flourished about the year 235 B. C. having served in the first Punic war (264–241 B. C.), which he celebrated in an epic poem (Gell. xvii. 21, 45; v. 12, 7). He wrote a little before the time of Ennius, who was born in 239 B. C. and died in 169. He was younger than Livius Andronicus, who exhibited his first play the year before Ennius was born, B. C. 240. Nævius was the author of several tragedies, many of the titles of

Nafels || Nagy-Enyed.

which have been preserved; and from them it is easy to discover that they were imitations of the Greek writers. But he appears to have earned still higher praise by his labours as a writer of comedy. Pursuing the path of the old Attic comedy, he lashed with an unsparing hand the vices of the Roman nobles; for which he was driven into exile, or, according to others, confined in prison, where he nevertheless seems to have written two tragedies. Such an example of severity could not have but impeded the free development of the comic muse of Rome. All that remains of the comedies of Nævius are the mere names, and a few insignificant fragments. The epic poem on the first Punic war was divided into seven books by C. Octavius Lampodio (Sueton. *De Illust. Gram.* 2). Nævius died in exile at Utica, on the coast of Africa, B. C. 201, the very year in which the second Punic war terminated. (Eusebius.) The fragments have been published under the title of *Ennii Annal. Fragmenta et Cn. Nævii Fragm.* Leipzig, 1825.

NAFELS, a town of Switzerland, of the canton of Glaris, the capital of the Catholic division of that canton. It stands on the river Linth, in a fruitful and pleasant district. The small river Rautibach, on its fall into the Linth, forms a fine, and at times a most copious cascade. A great victory was gained here by the Swiss in 1388, and it is still yearly celebrated with religious and military ceremonies. The town contains 220 houses, with 1730 inhabitants, who are chiefly employed in agriculture.

NAFF, a considerable river of Hindustan, forming the boundary between Bengal and Arracan. Its banks are rugged and woody, interspersed with spots of cultivation, and a few villages inhabited by a race of herdsmen, whose principal occupation consists in hunting the wild elephants.

NAGAL, a town of Hindustan, in the province of Delhi, situated on the east side of the river Ganges. Long. 78. 10. E. Lat. 29. 43. N.

NAGAMANGATAM, a large square mud fort in the south of India, and province of Mysore. It contains a square citadel in its centre, in which are two Hindu temples, and all the public granaries and store-rooms. The town is said to be 600 years old, having been erected by a prince named Jagadeva Raya, of the same family with the present Mysore rajah. It was taken by the Mahrattas in 1793; and the number of houses was reduced from 1500 to 300; but it has since rapidly recovered its population and its wealth. Long. 76. 57. E. Lat 12. 49. N.

NAGHERY, a town of the south of India, in the Carnatic, forty-eight miles north-west by west from Madras. Long. 79. 45. E. Lat. 13. 19. N.

NAGJERY, a town of Hindustan, in the province of Khandesh, 32 miles west by north from Boorhanpoor. Long. 75. 50. E. Lat. 21. 25. N.

NAGNE, a small river in the Gujerat peninsula, which rises in a range of hills, fourteen miles to the south-east of Lawria, and, after passing the city of Noanagur, falls into the Runn, in the Gulf of Cutch.

NAGY-BANYA, a city of the Austrian kingdom of Hungary, of the circle of the Farther Theiss, and the capital of a district of the same name. It is situated in the centre of a mining country, from which much gold, silver, and lead are extracted; and it has an institution for the education of the miners. There is a mint, in which the metals produced around it are coined into money. The inhabitants are a mixed population of Germans, Hungarians, and Greeks, and have a Catholic, a Lutheran, a Calvinist, and a Greek church, for the adherents of those several modes of worship; the whole number is 5800. Around the city there are some vast woods of chestnut trees, the fruit of which is a valuable article of trade; and there is a considerable commerce in corn. Long. 23. 29. E. Lat. 47. 37. N.

NAGY-ENYED, a city of the Austrian province of Siebenbergen, the ancient Transylvania, and the capital of a circle of the same name, near the great river Marosch. It contains a mixed population of 6400 persons, composed of Hungarians, Armenians, Wallachians, and Saxons. It has a Catholic, a Lutheran, and a Calvinist church, a Catholic monastery, and a college for Calvinistic education, with a large library.

Nagy-Karoli || Nain.

NAGY-KAROLI, a large town of the circle of Szathmar, in the province of Farther Theiss, in Hungary. It is situated on a fruitful spot, and has a splendid palace and gardens belonging to Count Karoli, a Catholic, a Calvinist, and a Unitarian church, a college of philosophy, and a Catholic gymnasium. It contains 943 houses, and 7567 inhabitants, amongst whom are many Jews. Long. 22. 22. 40. E. Lat. 47. 40. 10. N.

NAGY-KOBESCH, a city of Hungary, in the district of Pesth. It is composed of 12,000 inhabitants, almost wholly of the original Magyar or Hungarian race, who adhere to the Calvinist church, and are chiefly occupied in agriculture, producing good wine, and rearing large flocks of sheep. Long. 19. 47. E. Lat. 47. 1. N.

NAHN, a district of Hindustan, partly situated in the province of Delhi, on its north-eastern frontier, and partly in Serinagur. It is between the thirtieth and thirty-second degrees of north latitude, and is bounded on the east by the river Jumna. The country is in general woody and mountainous; but is interspersed in the neighbourhood of the city with low hills and extensive wastes, overgrown with wood; yet these wastes might be watered from the Jumna, and brought under cultivation. They are, however, open to the inroads of both the Sikhs and Nepaulese, who plunder the country; and hence the peasants have no encouragement to be industrious. The country is possessed by native chiefs, ever jealous of each other, and who plunder the miserable peasantry, and are in their turn plundered by other robbers more powerful than themselves. The capital, of the same name, is a place of considerable strength, being built of stone, and situated upon the summit of a lofty mountain. Long. 77. 7. E. Lat. 30. 41. N.

NAHR EL BERD, a river of Syria, in the pachalik of Tripoli, which falls into the Mediterranean, about nine miles north of Tripoli.

NAHR ELTEMASIEH, a river of Syria, which falls into the Mediterranean, six miles south of Tortosa.

NAHR GEBAIL, a river of Syria, which falls into the Mediterranean, four miles south of Latakieh.

NAHR EL HOUALI, a river of Irak Arabi, the ancient Hermes, which rises in Mount Marius, passes by the ruins of Nisibis, and, after a short course, falls into the Khabour.

NAHR EL KEBIR, a considerable river of Syria, which rises in Mount Libanus, and, after a winding course, falls into the Mediterranean, twenty miles north-east of Tripoli.

NAIADES, in fabulous history, certain inferior deities who presided over rivers, springs, wells, and fountains. The Naiades generally inhabited the country, and resorted to the woods or meadows near the stream over which they presided. They are represented as young and beautiful virgins, each leaning upon an urn, from which flows a stream of water. Ægle was, according to Virgil, the fairest of the Naiades. Their name appears to be derived from *ναειν, to flow*. They were held in great veneration amongst the ancients; and often sacrifices of goats and lambs were offered to them, with libations of wine, honey, and oil. Sometimes they received only offerings of milk, fruit, and flowers.

NAIANT, in *Heraldry*, a term used in blazoning fishes, when borne in a horizontal posture, as if swimming.

NAIN, Lewis Sebastian de, a French critic and historian, was son of a master of the requests, and was born at Paris in 1637. At ten years old he went to school at Port-Royal, and became one of the best writers of that in-

Naiant ‖ Nairnshire.

stitution. Sacy, his intimate friend and counsellor, prevailed with him in 1676 to receive the priesthood; which, it seems, his great humility would not before suffer him to aspire to. This virtue he seems to have possessed in the extreme; so that Bossuet, seeing one of his letters to Father Dami, with whom he had some little dispute, besought him merrily "not to be always upon his knees before his adversary, but to raise himself up now and then." He was solicited to push himself forward in the church; and Buzanval, bishop of Beauvois, wished to have him for his successor; but Nain, regardless of dignities, wished for nothing but retirement, so that he might indulge in the mortifications of a religious life and the indefatigable cultivation of letters. He died in 1698, aged sixty-one. His principal works are, 1. Memoirs on the Ecclesiastical History of the first six ages of the Church, in sixteen vols. 4to; and, 2. The History of the Emperors, in six vols. 4to. These works are deduced from original sources, and composed with fidelity and accuracy.

NAIRNSHIRE, a small county in Scotland. It is situated between 57° 22′ and 57° 40′ north latitude, and 3° 47′ west longitude, having the Moray Frith on the north, Morayshire on the east and south, and the county of Inverness on the west. Its extent from north to south is from twelve to twenty miles, and from east to west from ten to thirteen; and its contents are 198 square miles, or 126,720 English acres, of which only about a fourth part is in cultivation, the rest consisting principally of waste and moor ground, with about 8000 acres of wood, chiefly planted, about two square miles of lakes, and a small proportion of moss. It has only four entire parishes, Nairn, Auldearn, Cawdor, and Ardclach, and portions of other five, which belong to the counties of Moray, Ross, and Inverness. Two detached districts, Ferintosh and Dunmaglass, belong to Nairnshire; the former lying near Dingwall in Rossshire, and the latter at the head of Strathnairn in Inverness-shire.

The sea shore of Nairnshire is low, bare, and sandy; and the approaches to it from the Moray Frith are all beset by numerous sand-banks, especially from Fort George to Whiteness Point, where the free channel is narrow, and the navigation intricate and dangerous. To the eastward the sand has been drifted into hillocks and even hills of sand, the parents, it is believed, of the great sand floods which have buried the estate of Culbin, below Forres. Near to the coast there rises to the height of about ninety feet a bluff terrace-bank, from the top of which the country deflects back in several gentle undulations to the slopes of the first chain of hills on the south side of the river Nairn, the undulating plain being from one to four or five miles broad. The terrace-bank is part of a general one which encircles the Moray Frith, and which, with the waving cultivated grounds behind, consists of a great deposit of sand and gravel, the rolled *débris* in part of the ancient mountains, and also, most likely, of the solid rocks which at one time filled up the basin of the frith. Owing to this preponderance of sand in the subsoil, the alluvial covering of Nairnshire is in general extremely slight, sandy, and porous; and as the gravel beds are deep, rocks *in situ* are but seldom seen (with the exception, however, of some about the principal town, and Boath, which form good building stones) till we reach the south-western bank of the river Nairn. There the nearest chains of hills, which, rising gradually from the east to an altitude, on the confines of Inverness-shire towards the west, of perhaps 1500 feet, are skirted by a narrow strip of the old red sandstone formation, with its associated coarse conglomerate, dip beneath the gravel beds. Immediately behind, the whole country, extending from the river Nairn to the Findhorn, and in one part beyond it to Duthel in Strathspey, consists of primitive rocks, the only stratified member of which is gray gneiss, with a few occasional beds of bluish granular limestone. All the rest are varieties of granite, the most abundant variety being a red or flesh-coloured and large-grained granite, which about Park is beautifully porphyritic, with large crystals of felspar. All the rocks, as well those of the sandstone deposits on the north, as of the primary masses in the interior, exhibit undoubted and very extensive indications, in their shattered and uplifted positions, of several great granitic eruptions having occurred at different times. Nairnshire.

On the Findhorn the scenery is in general wild and grand; the hills above are moorish, lumpish, and unbroken in their outlines; the banks of the Nairn, excepting the short distance they are enlivened by the contiguous pleasure grounds attached to the several seats of Kilravock Holm and Contray, are tame and uninteresting; but along the course of the streams traversing the sandstone rocks, we meet scenes of simple picturesque beauty. Such especially is the burn of Cawdor, which, for about two miles above the Castle of Cawdor, has cut down the conglomerate rocks into most beautiful pyramidal curves, the deep dell stretching around them being clothed with the most luxuriant vegetation, from either side of which a fine old oak forest, and more recent plantations of pines and oaks, cover for miles the lower slopes of the hills constituting the beautiful grounds of Lord Cawdor.

Nairnshire cannot boast of a peculiar Flora; but some rare plants occur, as potamogeton prælongus in Lochlee, and along with nymphæa alba in Loch Littie; gagea lutea and ranunculus auricomus near Blackhills; carex vesicaria and lycopus europæus near Millhill; salicornia herbacea, teesdalia nudicaulis, and carex incurva, about Nairn; milium effusum, festuca calamaria, convallaria majalis, lycopus europæus, listera ovata, goodyera repens, scolopendrium vulgare, lycopodium inundatum, about Cawdor.

The territory of Nairnshire, exclusive of the lands belonging to and held of the burgh of Nairn, is divided into fifteen estates, of which nine are under the valuation of L.500 Scots, other three under L.2000, and the remaining three above L.2000. The valued rent is L.15,062. 15s. 1d. Scots, of which about one fourth is entailed. The real rent is now (1837) supposed to be fully L.16,000. The principal residences are, Cawdor Castle, the Earl of Cawdor; Kilravock Castle, Rose; Lethen House and Coulmony, Brodie; Kinsteary, Gordon; Boath, Dunbar; and Geddes, Mackintosh.

This county is further subdivided into farms, in general small and unenclosed. Although it is far behind the neighbouring counties of Moray and Ross in its agriculture, yet the gradual introduction of the use of lime along with the turnip husbandry is fast ameliorating the appearance of the cultivated districts of the county. Its live stock presents nothing worthy of particular notice; the cattle are generally small and puny, a sort of mongrel breed intermediate between the Highland and the Morayshire, but inferior to both.

This county sends a member to parliament along with Elginshire; and the town of Nairn joins with Inverness, Forres, and Fortrose, in the election of a member for these burghs. The number of county electors is 116, and those of the burgh amount to seventy-one. The counties of Elgin and Nairn are under the jurisdiction of the same sheriff, who has a substitute for the latter county in the town of Nairn.

Nairnshire formed a part of the ancient province of Moray. A few miles to the east of Nairn, at a place called Harmuir, Macbeth, according to Shakspeare, met the witches on his way to Forres. Near to the village of Auldearn, Montrose obtained a great victory over the Covenanters in 1645. The county contains the ruins of several castles, and other remains of an early age. The castles of

Nairn ‖ Name.

Cawdor and Kilravock, both of great antiquity, are still the seats of their proprietors.

In the county of Nairn there are no manufactures properly so called. It is almost exclusively agricultural.

Name.

YEAR.	HOUSES.			OCCUPATIONS.			PERSONS.		
	Inhabited.	By how many Families occupied.	Uninhabited.	Families chiefly employed in Agriculture.	Families chiefly employed in Trade, Manufactures, or Handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.
1811	1946	2021	68	870	341	810	3530	4721	8251
1831	2074	2246	92	742	487	1017	4307	5047	9354

NAIRN, the county town, and a royal burgh, is a place of considerable antiquity, pleasantly situated on the northern bank of the Nairn, near its mouth. It has no manufactures, and but little trade, and contains about 2000 inhabitants. The National Bank and the British Linen Company have opened branches here, and an academy has lately been erected by subscription. Nairn has an excellent inn, with hot and cold salt-water baths; and from the dryness and salubrity of the climate, it is much resorted to in summer for sea-bathing.

NAISSANT, in *Heraldry*, is usually applied to any animal issuing out of the midst of some ordinary, and showing only his head, shoulders, fore feet, and legs, with the tip of his tail, the rest of his body being hid in the shield, or some charge upon it. In this it differs from *issuant*, which denotes a living creature arising out of the bottom of any ordinary or charge.

NAJOO, a small island in the Eastern Seas, near to the west coast of the island of Celebes. Long. 124. 25. E. Lat. 129. S.

NAMACUL, a town of the south of India, and district of Baramahl, subject to the British. It has a strong fort, situated on a rock of granite. Long. 78. 5. E. Lat. 11. 22. N.

NAMAGANG, a small island in the Eastern Seas, situated in long. 123. E. and lat. 6. 45. N.

NAMBOODY, a town of Hindustan, in the province of Aurungabad. It belongs to the Mahrattas, and is sixteen miles north from Ahmednuggur. Long. 73. 3. E. Lat. 19. 15. N.

NAME denotes a word by which men have agreed to expresss some idea, or which serves to denote or signify a thing or a subject spoken of. This the grammarians usually call a *noun*, *nomen*, though their noun is not of quite so much extent as our name. Seneca (*de Beneficiis*, lib. ii.) observes, that there are a great number of things which have no name, and which, therefore, we are forced to call by other borrowed names. *Ingens est*, says he, *rerum copia sine nomine, quas cum propriis appellationibus signare non possumus, alienis accommodatis utimur;* which may show why, in the course of this work, we frequently give various senses to the same word.

NAMES are distinguished into *proper* and *appellative*. *Proper* names are those which represent some individual thing or person, so as to distinguish it from all other things of the same species; as *Socrates*, which represents a certain philosopher. *Appellative* or general names are those which signify common ideas, or which are common to several individuals of the same species; as *horse*, *animal*, *man*, *oak*, and the like. Proper names are either called Christian, as being given at baptism, or surnames; the first being imposed for distinction of persons, answering to the Roman *prænomen;* the second, for the distinction of families, answering to the *nomen* of the Romans, and the *patronymicum* of the Greeks.

Originally every person had but one name, as amongst the Jews, Adam; amongst the Egyptians, Busiris; amongst the Chaldees, Ninus; the Medes, Astyages; the Greeks, Diomedes; the Romans, Romulus; the Gauls, Divitiacus; the Germans, Ariovistus; the Britons, Cassibelaunus; the English, Hengist, &c.; and so of other nations, except the savages of Mount Atlas, whom Pliny and Marcellinus represent as *anonymi*, or nameless. The Jews gave the name at the circumcision, viz. eight days after the birth; the Romans, to females on the eighth day, to males on the ninth; at which time they held a feast, called *nominalia*. Since Christianity has obtained, most nations have followed the Jews, baptizing and giving the name on the eighth day after the birth; excepting our English ancestors, who, until recently, baptized and gave the name on the birth-day. The first imposition of names was founded on different views, amongst different people; the most common was to mark the good wishes of the parents, or to entitle the children to the good fortune which a happy name seemed to promise. Hence Victor, Castor, Faustus, Statorius, Probus, and the like. Accordingly, we find that such names, by Cicero called *bona nomina*, and by Tacitus, *fausta nomina*, were first enrolled and ranged in the Roman musters, because those bearing them were first called to serve at the sacrifices, in the foundation of colonies, &c. And, on the contrary, Livy calls Atrius Umber, *abominandi omnis nomen;* whilst Plautus, on occasion of mentioning a person named *Lyco*, or greedy wolf, says,

> Vosmet nunc facite conjecturam cæterum
> Quid id sit hominis, cui Lyco nomen fiet.

Hence Plato recommends it to men to be careful in giving happy names; and the Pythagoreans taught expressly, that the minds, actions, and successes of men were according to their names, genius, and fate. Thus Panormitan, *ex bono nomine oritur bona præsumptio;* and the common proverb, *Bonum nomen bonum omen;* and hence the foundation of the onomomantia. It is an observation deserving attention, says the Abbé Barthélemi, that the greater part of names found in Homer are marks of distinction, and appear to have been given in honour of the qualities most esteemed in the heroic ages. From the word *polemos*, which signifies war, have been formed *Tlepolemus* and *Archepolemus*, the names of two heroes mentioned in the Iliad. The former name signifies *able to support*, and the latter, *able to direct*, the labours of *war*. By adding to the word *maché*, or *battle*, certain prepositions and different parts of speech, which modify the sense in a manner always honourable, are composed the names *Amphimachus*, *Antimachus*, *Promachus*, *Telemachus*. Proceeding in the same way, with the word strength or intrepidity, they formed the names *Agapenor*, "he who esteems valour," and *Agenor*, "he who directs it." From *thoes*, swift, are derived *Alca-*

Name.

thoes, Panthoes, Perithoes, &c.; from *nous,* mind or intelligence, come *Astynoes, Arsinoes, Autenoes;* from *medes,* counsel, *Agamedes, Eumedes, Lycomedes, Thrasymedes;* and from *clios,* glory, *Amphicles, Agacles, Iphicles, Patroclus, Cleobulus,* and many others. Hence Camden takes it for granted, that the names, in all nations and languages, are significative, and not simple sounds for mere distinction's sake. This holds not only amongst the Jews, Greeks, and Latins, but even amongst the Turks, with whom Abdallah signifies *God's servant,* Soliman, *peaceable,* Mahommed, *glorified,* &c.; and also amongst the savages of Hispaniola, and throughout America, who, in their languages, name their children *Glistering Light, Sun, Bright, Fine Gold,* &c.; whilst those of Congo call them by the names of precious stones, flowers, &c. To suppose names given without any meaning, however their signification may be lost by the alteration of language, that learned author thinks is to reproach our ancestors, and that too contrary to the sense of all ancient writers. Porphyry remarks, that the barbarous *names,* as he calls them, were very emphatical, and very concise; and accordingly it was esteemed a duty to be φηζωνυμοι, or *sui nominis homines.* Hence Severus, Probus, and Aurelius, are called *sui nominis imperatores.* It was the usual way of giving names, to wish the children might discharge their names. Thus, when Gunthram king of France named Clotharius at the font, he said, *Crescat puer, et hujus sit nominis executor.* The ancient Britons, Camden says, generally took their names from colours, because they painted themselves; but these names are now lost, or remain hid amongst the Welsh. When they were subdued by the Romans, they took Roman names, some of which still remain corrupted; though the greater part became extinct upon the admission of the English Saxons, who introduced the German names, as *Cridda, Penda, Oswald, Edward,* and the like. The Danes, too, brought with them their names; as *Suayne, Harold, Knute,* &c. The Normans, at the Conquest, brought in other German names, having originally used the German tongue; such as *Robert, William, Richard, Henry, Hugh,* &c. in the same manner as the Greek names *Aspasius, Boethius, Symmachus,* &c. were introduced into Italy upon the division of the empire. After the Conquest, our nation, which had ever been averse to foreign names, as deeming them unlucky, began to take Hebrew names; as *Matthew, David, Samson,* &c. Camden mentions it as an opinion, that the practice of giving surnames for Christian names first began in the reign of Edward VI. and was observed by such as would be godfathers, when they were more than half fathers; upon which some were persuaded to change their names at confirmation, which seems to have been usual in other countries. Thus, two sons of Henry II. of France, christened *Alexander* and *Hercules,* changed them at confirmation into *Henry* and *Francis.* In monasteries, the religious assume new names at their admission, to show that they are about to lead a new life, and have renounced the world, their family, and even their name; as, for instance, sister Mary *of the Incarnation,* brother Henry *of the Holy Sacrament,* and the like. The popes also changed their names at their exaltation to the pontificate; a custom first introduced by Pope Sergius, whose name till then, as Platina informs us, was *Swine's Snout.* But Onuphrius refers it to John XII. or XIII. and at the same time adds a reason for the change different from that of Platina, namely, that it was done in imitation of St Peter and St Paul, who were first called *Simon* and *Saul.*

Amongst the ancients, those deified by the heathen consecrations had new names given them; thus, Romulus was called *Quirinus;* Melicertes, *Portunus* or *Portumus,* &c. New names were also given in adoptions, and sometimes by testament. Thus L. Æmilius, adopted by Scipio, took the name of *Scipio Africanus;* and Augustus, who was at first called *C. Octavius Thurinus,* being adopted by the testament of Julius Cæsar into his name and family, took the name of *Caius Julius Cæsar Octavianus.* Names were also changed at enfranchisements into new cities. Thus, Lucumo, on his first being made free of Rome, took the name *Lucius Tarquinius Priscus;* and slaves, when made free, usually assumed the names of their masters. Those called to the equestrian order, if they had base names, were always new-named, *nominibus ingenuorum veterumque Romanorum.* And amongst the primitive Christians, it was the practice to change the names of the catechumens; thus, the renegado Lucianus, till his baptism, was called *Lucius.* Towards the middle of the fifteenth century, it was the fancy of the wits and the learned men of the age, particularly in Italy, to change their baptismal names for classical ones; as Sannazarius, for instance, who altered his own plain name of *Jacopo* to *Actius Syncerus.* Numbers did the same, and, amongst the rest, Platina the historian at Rome, who, not without a solemn ceremonial, took the name of *Callimachus,* instead of *Philip.* Pope Paul II. who reigned about the same time, unluckily chanced to be suspicious, illiterate, and obtuse in comprehension. He had no idea that persons could wish to alter their names unless they had some bad design; and actually scrupled not to employ imprisonment and other violent methods to discover the fancied mystery. On this frivolous pretence, Platina was most cruelly tortured; but he had nothing to confess, and so the pope, after endeavouring in vain to convict him of heresy, sedition, and other crimes, released him after a long imprisonment.

Nampt-wich ‖ Namur.

NAMPTWICH, or NANTWICH, a market-town of the hundred of its own name, in the county of Chester, an hundred and sixty-five miles from London. It is situated on the banks of the river Wever, and has by canals good water communication in all directions. It is one of the largest and best-built towns in the county, with regular streets and handsome houses. It was known to the Romans by the name of *Salinis,* and must at all times have been a place of importance, from the vast quantities of salt procured from its vicinity. This product is partly made from brine springs highly saturated; and prodigious masses of rock-salt are drawn from mines, or rather quarries, near the town. These mines are many acres in extent. The roofs are supported by pillars, both of the same substance; and the translucent nature of the salt affords a pleasing and picturesque appearance. Many thousands of tons of this rock-salt are annually exported from Liverpool to the ports of Prussia, Russia, and Sweden, on the Baltic Sea. The country around yields a large portion of the best Cheshire cheese; and the trade in that article is carried on upon a very extensive scale, especially with London. The making of shoes is one source of employment; and many of them are sent to the metropolis and other parts of England. There is a well-supplied market, which is held on Saturday. The population of the town amounted in 1801 to 3463, in 1811 to 3999, in 1821 to 4661, and in 1831 to 4886; but the parish includes five other townships, which, by the last census, appear to make the inhabitants of the whole 5357.

NAMUR, a province of the Netherlands. It is formed out of a large portion of the French department of the Sambre and the Meuse, of parts of the ancient duchy of Namur, of some parcels of Liège, Luxemburg, and Brabant, and of the cantons of Philipville and Couvin, ceded to the Netherlands by the peace of 1815. It extends in north latitude from 49. 47. to 50. 49. and in east longitude from 4. 15. to 5. 13. It is 1342 square miles in extent; it is formed into three circles, fifteen cantons, and 313 communes; and it contains 165,000 inhabitants. The surface is covered with hills and mountains, with many valleys between them, in which channels are formed for numerous springs. There are scarcely any ex-

Nancowry ‖ Nancy.

tensive plains; but the lower hills, not exceeding 360 feet in height, are for the most part covered with woods. The soil in the northern division is of moderate fertility, but in the south it is stony, chalky, or slaty, being almost destitute of mould, and covered with heath or scrubby woods. Agriculture is well conducted in the arrondissement of Namur, but neglected in other parts; so that, with the help of potatoes, which are extensively cultivated, the province barely furnishes corn sufficient for its scanty population, rye and winter barley being the species of grain chiefly grown. Flax, hemp, and rape-seed are produced, but in small quantities. Fruit is abundant, especially walnuts. The vine is but partially cultivated, the whole of the vineyards not exceeding thirty acres. Mines of iron and coal are found in several parts, and worked to such an extent, that about 10,000 tons of cast and wrought iron are procured, and soon converted into utensils. There are manufactures of glass, paper, porcelain, and leather, besides many breweries and distilleries. The inhabitants are of the Walloon race, and much attached to the old customs and religion; they for the most part speak only their peculiar patois, and are almost entirely destitute of education. The two principal rivers, the Sambre and the Meuse, serve to carry off the waters of the numerous small streams, and, when united, become navigable, but only for small craft. The city of Namur is the capital, as well of the arrondissement as of the province. It is situated between two hills, in a valley, on the left bank of the Meuse, where that river is joined by the Sambre and the Bederin. It is strongly fortified, and has a powerful citadel, commanding the city, as well as the passage over the river. It is a well-built place, though with no buildings of a remarkable character. It contains 16,800 inhabitants, who are the chief manufacturers of the province. Long. 4. 45. 7. E. Lat. 50. 28. 3. N.

NANCOWRY, one of the Nicobar Islands, situated in the Bay of Bengal. It is about twenty-five miles in circumference, and has a rich soil, which, however, is but little cultivated. Between this, the island of Cornarty, and another island, is a very capacious bay, in which ships may lie in the most perfect security. The best entrance is on the east side. The western entrance is narrow, being only 100 fathoms wide, and the tide rolling through it with great force, though it is sufficiently deep to admit the largest vessels. The natural productions of this island are cocoanuts, papias, plantains, limes, tamarinds, betel-nut, and a species of bread fruit. Rice is unknown; but yams and other roots are cultivated; and the mangosteen tree and pine apples grow wild. The inhabitants are Mahommedans, and are a civil, quiet people. They are stout and well made, but, like all barbarous people, nowise industrious. They rear a great number of poultry, which they barter for cloth, cutlery, tobacco, and other articles. Their houses are built on piles so near the shore as frequently to admit of the tide flowing under them. The Danes had formerly a small settlement here, consisting of missionaries and a few soldiers. It existed as late as the year 1791, and was withdrawn on account of the sickness amongst the troops, and of the little advantage derived from it. The island is annually visited by from fifteen to twenty large prows, with Malays and Chinese from the coast of Malacca, in quest of edible bird-nests. Long. 93. 43. E. Lat. 7. 57. N.

NANCY, an arrondissement of the department of the Meurthe, in France, extending over 537 square miles. It is divided into six cantons, and subdivided into 187 communes, containing 129,841 inhabitants. The city of Nancy, the capital of the arrondissement, is also the capital of the department of the Meurthe, and the seat of the several administrative boards. It is finely situated at the foot of a hill covered with woods, and watered by the river Meurthe. It is surrounded with ancient walls, and is well built, having beautiful squares, highly adorned by the several buildings around them, and by some elegant triumphal arches. There is here a public collegiate school, with a library of 50,000 volumes, a botanic garden, and cabinets of natural history. In the year 1836, Nancy contained 31,445 inhabitants, and it is a place of active industry. The chief articles made are cotton and thin woollen goods, paper, pottery and porcelain ware, liqueurs, starch, snuff, leather, and chemical preparations. Long. 7. 5. 11. E. Lat. 48. 41. 55. N.

Nandaprayaga ‖ Nani.

NANDAPRAYAGA, a celebrated place of Hindu worship in Northern Hindustan, being situated in the province of Serinagur, at the confluence of the Alcananda with the Nandacni. This is one of the most northerly places of Hindu worship. Long. 79. 22. E. Lat. 30. 22. N.

NANDERE, a district of Hindustan, in the Deccan, 150 miles in length, and about 35 in breadth, being intersected by the river Godavery. The soil is fertile, well watered, and capable of being much improved. The capital is of the same name, and contains a good fortress built of stone, which is garrisoned by the nizam's troops. It is situated in long. 77. 35. E. and lat. 19. 6. N.

NANDOOR, a town of the south of India, in the Northern Circars, seventy-four miles south-west by south from Vizagapatam. Long. 82. 25. E. Lat. 17. 27. N.

NANGA, a sea-port of the island of Niphon, situated on a bay on the south coast, fifty-five miles south-west from Jedo. Long. 139. 16. E. Lat. 35. 52. N.

NANGASAKI, one of the sea-ports of Japan, at the south-western extremity of the island of Ximo, and one of the largest commercial sea-ports in the island. It is the only point of the empire at which Europeans are permitted to trade; and this permission is confined to the Dutch. The island of Ximo is separated from Nangasaki only by a ditch. It has two gates, one of which, looking to the town, is shut at night upon the Dutch, and is guarded by the Japanese. The other looks to the harbour, which is three miles in length and one in breadth. The Dutch town is built lengthwise, and contains several large storehouses, which have been made fire-proof. The other houses are built of wood, clay, and tiles, with paper windows, and floor-mats of straw. The Japanese interpreters have a large house, and also the Ottonas, who are a sort of spies, and report all that they see to the governor. The Dutch company pay fifteen per cent. and private traders seventy-five per cent. on all goods imported. Nangasaki, the Japanese town, is built at the head of the harbour, and has neither walls nor fortifications. There are two towns; the inner, which contains twenty-six, and the outer, which contains sixty-one streets. These streets are neither straight nor spacious, although many merchants and artificers reside in them. The city is watered by three rivulets, descending from the neighbouring mountains. The most handsome houses are the palaces of the two resident governors, and of other princes and grandees. There are sixty-two temples built on eminences, serving for worship, and also for recreation. Long. 130. 12. E. Lat. 32. 48. N.

NAN-HIUNG, or NAN-YONG, a large and populous city of China, in the province of Quangtong, on the northern side of a mountain, which crosses the great road between Pekin and Canton.

NANI, JOHN BAPTIST, was born in 1616. His father was procurator of St Mark, and ambassador from Venice to Rome. He was educated with attention, and made considerable improvement. Urban VIII. a good judge of merit, soon perceived that of young Nani. He was admitted into the college of senators in 1641, and was shortly afterwards nominated ambassador to France, where he signalized himself by his complaisant manners. He procured considerable succours for the war of Candia against the Turks, and, after his return to Venice, became superintendent of the war-office and of finances. He was subsequently ambassador to the empire, where he rendered those

Nanka Islands || Nantes.

services to his country which, as a zealous and intelligent citizen, he was so well qualified to discharge. He was again sent to France in the year 1660, to solicit fresh succours for Candia, and on his return was appointed procurator of St Mark. He died on the 5th of November 1768, at the age of sixty-three, much regretted by his countrymen. The senate had appointed him to write the History of the Republic, which he executed to the satisfaction of the Venetians, although the work has not been admired by foreigners. This history was printed at Venice in 1662 and 1679, in two vols. 4to.

NANKA ISLANDS are three in number, and are situated near the west coast of Banca. They produce wood for fuel, and excellent water. Long. 105. 41. E. Lat. 2. 22. S.

NANKANG, a city of China, of the first rank, in Kiangsee. It is situated on a branch of the Poyang Lake. Long. 115. 39. E. Lat. 29. 33. N.

NANKING, a large city of China, and at one time the capital of the southern division of the empire; but, since Pekin became the seat of government, it has lost its former importance, and its population has also diminished. Nanking is situated on the southern bank of the river Yang-tse-Kiang; it was formerly visited by vessels of great burden, and still communicates by smaller barks with all the interior of the empire, and with Pekin by the great canal. It has fine manufactures of silk, which are considered as its staple; and also plain and flowered satins, besides thin woollen stuffs. It is considered as a seat of Chinese learning, being the residence of many great doctors; and the booksellers' shops are better furnished than any in the empire. The city is kept very clean, though the streets are narrower than those of Pekin. The public eating-houses are numerous, and well supplied. Formerly Nanking had a magnificent palace, which was destroyed in 1645, by the Mantchoo Tartars. It is still adorned with lofty and splendid gateways, and with temples attached to them. It has also a very curious porcelain tower. This celebrated pagoda is of an octagonal form, nine stories in height, and the date of the structure is 1411. Long. 118. 34. E. Lat. 32. 4. N.

NAN-NING, a city of China, in Quangsee, situated in the midst of rivers and small lakes, and of mountains containing iron mines. Long. 107. 44. E. Lat. 22. 44. N.

NANPAREH, a town of Hindustan, in the territories of the Nabob of Oude, eighty miles north-north-east from Lucknow. Long. 81. 30. E. Lat. 27. 52. N.

NANTES, a city of France, the capital of the arrondissement of the same name, in the department of the Lower Loire. It is one of the principal sea-ports of the kingdom, and owes much of its importance to its local situation. It stands in a fine country on the right bank of the river Loire, about thirty miles from its mouth, and opposite to the point where the river Sèvre falls into that stream. The entrance to the Loire is very dangerous, on account of the many sunken rocks near its mouth. Of these, the most remarkable are, Le Turque, uncovered at low water; La Couronne, a most dangerous reef, having ten fathoms of water close to it; and the Lamborde, a rock level with the water at low spring tides. These are all on the north-west side of the entrance; but on the south-west side the dangers to be avoided are, the Leven, a rock nearly covered at half tide; Pierre Percée, an islet, elevated about thirty feet above low water; the Baguenard, another rock nearly covered at half tide, upon which a bank of sand is visible; the Grand Charpentier, Petit Charpentier, and La Vieille, three rocks of nearly equal height, and even with the sea at neap tides; and Les Morées and La Truye, appearing about eight feet above the water at neap tides. The commercial importance of Nantes depends in a great measure upon the length of the river Loire, which is nearly 500 miles, and the means afforded, by the help of canals, which connect it with the Seine, the Rhone, and the Soane, of conveying to its harbour a portion of the productions of every department in France.

Nantua || Napier.

The trade by sea is shown by the number and tonnage of vessels which entered the port in the year 1831; the one being 3344, and the other 146,258 tons. Of the foreign ships, seventeen were British, estimated at 1780 tons. The amount of duty on exportation and importation, including that on salt, which is very heavy, was, in 1831, 15,100,374 francs, or L.575,000; in 1832 it amounted to 13,907,400 francs, or L.522,000. Nantes is also a place of considerable manufacturing industry. One of the most prominent branches is ship-building, including the fabrication of cables, cordage, sailcloth, and anchors, with other articles made of iron. Weaving and spinning of woollen, linen, cotton, and silk, occupy a great number of hands. Glass and earthen ware are also made, and many hats, and much leather of all kinds. Sugar-mills, and other engines used in the sugar colonies, are extensively prepared, and the refining of sugar is a vast branch of trade. There are also many distilleries, in which the most delicious cordials are prepared, and possess great celebrity.

Nantes is finely situated on the banks of the river, some islands in which are covered with houses. Though many of the buildings are old and not regular, some are handsome, especially in the parts recently erected. The fortifications have been destroyed, and are now formed into fine promenades. The river, which is very wide, is crossed by a succession of bridges connecting the five islands, and the passage over them is nearly three miles. The city has seventeen churches, and several other public buildings, amongst which is the cathedral built in the Gothic style. There is a university, a lyceum, an anatomical and naval school, a public library, a botanic garden, and a cabinet of natural history. There is likewise a theatre. This place is remarkable in history for the edict which gave freedom to Protestantism, and for the horrible cruelties perpetrated in it during the Revolution, by means of the *noyades*. The city contains 75,895 inhabitants. The arrondissement in which it is situated extends over 668 square miles, and is divided into seventeen cantons, and sixty-six communes, containing 205,892 inhabitants. Long. 1. 22. 44. W. Lat. 47. 13. N.

NANTUA, an arrondissement of the department of the Ain, in France, 326 square miles in extent. It comprehends six cantons, divided into seventy-one communes, and contains 50,826 inhabitants. The capital is the city of the same name, situated in a narrow valley between two mountains, on the border of the lake of Nantua. It has 340 houses, and 3696 inhabitants, who carry on several tanneries, paper and silk mills, and make hats and cotton goods. Long. 5. 33. E. Lat. 46. 8. N.

NANYANG, a town of China, of the first rank, in Honan. It is situated in a mountainous country, where provisions are cheap. Long. 112. 14. E. Lat. 33. 36. N.

NAPAKIANG, the principal sea-port in the great Loochoo Island, situated about five miles from the capital. The ships Lyra and Alceste lay here for some time, in a roadstead which afforded good anchorage. Long. 127. 37. E. Lat. 26. 13. N.

NAPHTHALI, or NEPHTHALI (Josh. xix.), one of the tribes of Israel, having Zabulon on the south, Asher on the west, the Jordan on the east, and on the north the Anti-Libanus.

NAPIER, JOHN, Baron of Merchiston in Scotland, and the inventor of the Logarithms, was the eldest son of Sir Archibald Napier of Edinbellie and Merchiston, by his first wife Janet Bothwell, and was born near Edinburgh, in the year 1550. Having given early indications of great natural parts, his father was careful to have them cultivated by a learned education. After passing through the ordinary

Napier.

courses of liberal study at the University of St Andrews, he is said to have made the tour of France, Italy, and Germany. Upon his return to his native country, his literature and other accomplishments soon rendered him conspicuous, and might have raised him to the highest offices of the state; but declining all civil employments, and avoiding the bustle of the court, he retired from active life to pursue scientific and literary researches, in which he made such uncommon progress, as to favour mankind with divers useful discoveries. He applied himself chiefly to the study of mathematics, and to that of the Holy Scriptures; and in regard to both, he has evinced the most extensive knowledge and profound penetration. His Commentaries upon the Apocalypse indicate the most acute investigation, and an uncommon strength of judgment; and though time has discovered that his calculations concerning particular events proceeded upon fallacious data, his reasonings are not on that account the less ingenious. This work was printed abroad in several languages; particularly in French at Rochelle in the year 1602, in a quarto volume, announced in the title as revised by himself. Nothing, it has been observed, could be more agreeable to the people of Rochelle, or the Huguenots of France, at this time, than the author's annunciation of the pope as antichrist, which in this book he has endeavoured to set forth with much zeal and erudition. But what has rendered his name for ever illustrious was his great and fortunate discovery of the logarithms, by which the science of astronomy and the arts of practical geometry and navigation have been wonderfully aided and advanced. That he had begun before the year 1594 the train of inquiry which led to this great achievement, appears evident from a letter to Crugerus, written by Kepler in the year 1624, wherein, mentioning the *Canon Mirificus*, he writes thus: "Nihil autem supra Neperianam rationem esse puto; etsi Scotus quidem literis ad Tychonem, anno 1594, scriptis jam spem fecit canonis illius mirifici." This allusion agrees with the idle story mentioned by Wood in his *Athenæ Oxoniensis*, and explains it in a way perfectly consonant to the rights of Napier as the inventor.

When Napier had communicated to Mr Henry Briggs, mathematical professor in Gresham College, his wonderful Canon for the Logarithms, that learned professor set himself to apply the rules in his *Imitatio Nepierea;* and in a letter to Archbishop Usher, written in the year 1615, he thus expresses himself:—"Napier, Baron of Merchiston, hath set my head and hands at work with his new and admirable Logarithms. I hope to see him this summer, if it please God; for I never saw a book which pleased me better, and made me more wonder." The following passage from the life of Lilly the astrologer gives a picturesque view of the meeting between Briggs and the inventor of the logarithms, at Merchiston, near Edinburgh. "I will acquaint you," says Lilly, "with one memorable story related unto me by John Marr, an excellent mathematician and geometrician, whom I conceive you remember. He was servant to King James I. and Charles I. When Merchiston first published his logarithms, Mr Briggs, then reader of the astronomy lectures at Gresham College in London, was so much surprised with admiration of them, that he could have no quietness in himself until he had seen that noble person whose only invention they were. He acquaints John Marr therewith, who went into Scotland before Mr Briggs, purposely to be there when these two so learned persons should meet. Mr Briggs appoints a certain day when to meet at Edinburgh; but failing thereof, Merchiston was fearful he would not come. It happened one day as John Marr and the Baron Napier were speaking of Mr Briggs; 'Ah, John,' said Merchiston, 'Mr Briggs will not come.' At the very instant one knocks at the gate: John Marr hasted down, and it proved to be Mr Briggs, to his great contentment. He brings Mr Briggs up to the baron's chamber, where almost one quarter of an hour was spent, each beholding the other with admiration before one word was spoken. At last Mr Briggs began: 'Sir, I have undertaken this long journey purposely to see your person, and to know by what engine of wit or ingenuity you came first to think of this most excellent help into astronomy, viz. the Logarithms; but, Sir, being by you found out, I wonder nobody else found it out before, when now being known it appears so easy.' He was nobly entertained by the illustrious baron; and every summer after that, during the baron's life, this venerable man, Mr Briggs, went purposely to Scotland to visit him."

Napier.

There is a passage in the Life of Tycho Brahe by Gassendi, which might lead some to suppose that Napier's method had previously been explored by Herwart at Hoenburg. This passage occurs in Gassendi's observations on a letter from Tycho to Herwart, written on the last day of August 1599. "Dixit Hervatus nihil morari se solvendi cujusquam trianguli difficultatem; solere se enim multiplicationum ac divisionum vice additiones solum, subtractiones 93 usurpare quod ut fieri posset, docuit postmodum suo logarithmorum Canone Neperus." But Herwart here alludes to the work afterwards published in the year 1610, which solves triangles by prostaphæresis, a mode totally different from that of the Logarithms.

Kepler, who was ignorant that Napier had been deceased for more than two years, addressed a letter to him, dated 28th of July 1619 (prefixed as a dedication to his *Ephemerides* for the year 1620), in which he expresses his high admiration of the *Canon Mirificus*, and his astonishment and delight on first becoming acquainted with the importance of Napier's great discovery. "And, indeed," to use the words of one of his biographers, "if we consider that Napier's discovery was not, like those of Kepler or of Newton, connected with any analogies or coincidences which might have led him to it, but the fruit of unassisted reason and science, we shall be vindicated in placing him in one of the highest niches in the temple of fame. Kepler had made many unsuccessful attempts to discover his canon for the periodic motions of the planets, and hit upon it at last, as he himself candidly owns, on the 15th of May 1618; and Newton applied the palpable tendency of heavy bodies to the earth to the system of the universe in general; but Napier sought out his admirable rules by a slow scientific progress, arising from the gradual evolution of truth." But to quote this, or any other similar observations of an ordinary biographer, may here be considered as worse than superfluous; for the *Dissertation on the History of Mathematical and Physical Science*, by the late Professor Playfair, prefixed to this work, contains a view of the nature and value of Napier's great discovery, and the character of his genius, which at once satisfies scientific curiosity, and throws into the shade all the slighter sketches of less weighty authorities.

The last literary exertion of this eminent person was the publication, in the year 1617, of his *Rabdology and Promptuary*, which he dedicated to the Chancellor Seton, and soon afterwards died at Merchiston, on the 4th of April of the same year, in the sixty-eighth year of his age.

This renowned discoverer was twice married. By his first wife, who was a daughter of Sir James Stirling of Keir, he had only one son, named Archibald. He was appointed a privy counsellor by James VI., under whose reign he also held the offices of treasurer-depute, justice-clerk, and senator of the college of justice; and by Charles I. he was raised to the peerage. By his second wife, a daughter of Sir James Chisholm of Cromlix, he had a numerous family of sons and daughters.

We have two Lives of the Inventor of the Logarithms;

Napier's Rods.

one by the late Earl of Buchan, with an analysis of Napier's printed works by Dr Walter Minto, published in 1787; the other by Mr Mark Napier, advocate, published in 1834; both in 4to. The biographical notice in the preceding editions of this work seems to have been compiled from the former; and we have not seen reason to make any material change, particularly as the Dissertation above referred to, and the article LOGARITHMS, contain all that is most deserving of attention in regard to the life of this great man. It may, however, be proper to subjoin a correct list of his different publications.

1. A plaine Discouery of the whole Reuelation of Saint Iohn; set downe in two treatises: the one searching and prouing the true interpretation thereof; the other applying the same paraphrastically and historically to the text. Set foorth by Iohn Napeir L. of Marchistoun younger. Edinburgh, printed by Robert Waldegrave, 1593, 4to. In republishing this work, in 1611, the author subjoined "A resolution of certaine doubts, mooved by some well-affected brethren." The "fifth edition" was printed at Edinburgh, 1645, 4to. It was translated into French by George Thomson, and printed at Rochelle, 1602, in 4to. On the title, it is said to have been revised by the author himself ("reveue par lui-même"), and was reprinted in 1605, and again in 1607, in 8vo.

2. Mirifici Logarithmorum Canonis Descriptio, ejusque usus, in utraque Trigonometria, ut etiam in omni Logistica Mathematica amplissimi, &c. explicatio. Edinburgi, ex officina Andreæ Hart, 1614, 4to.

3. Rabdologiæ, seu Numerationis per Virgulas libri duo: cum Appendice de expeditissimo Multiplicationis Promptuario. Quibus accessit et Arithmeticæ Localis liber unus. Edinburgi, excudebat Andreas Hart, 1617, 12mo. Reprinted at Lyons in 1626, and again in 1628, 12mo.

4. Mirifici Logarithmorum Canonis Constructio, et eorum ad naturales ipsorum numeros habitudines; una cum Appendice, de alia eaque præstantiore Logarithmorum specie condenda. Quibus accessere Propositiones ad triangula sphærica faciliore calculo resolvenda, &c. Edinburgi, excudebat Andreas Hart, 1619, 4to. This posthumous work was published by the author's third son Robert Napier. Some copies of it occur, along with the *Canonis Descriptio*, having a general title page for both, dated 1619, the original title of 1614 being cancelled. Both works were reprinted at Lyons in 1620, 4to; and the first, followed with copious "Observations," was included in Baron Maseres's large collection entitled "Scriptores Logarithmici," vol. vi.; London, 1807, 4to.

It is not necessary to specify the English translations or other works illustrative of these several publications.

NAPIER's Rods, or *Bones*, an instrument invented by Baron Napier, whereby the Multiplication and Division of large numbers is much facilitated. Suppose the common table of multiplication to be made upon a plate of metal, ivory, or pasteboard, and then conceive the several columns, standing downwards from the digits on the head, to be cut asunder; these are what are called *Napier's rods of multiplication*. But then there must be a good number of each; for as many times as any figure is in the multiplicand, so many rods of that species, or with that figure on the top of it, must we have, though six rods of each species will be sufficient for any example in common affairs. There must also be as many rods of 0's. But before we explain the mode of using these rods, there is another thing to be known, namely, that the figures on every rod are written in an order different from that in the table. Thus the little square space or division in which the several products of every column are written is divided into two parts by a line across from the upper angle on the right to the lower on the left; and if the product is a digit, it is set in the lower division, but if it has two places, the first is set in the lower, and the second in the upper division. The spaces on the top are not divided. There is also a rod of digits not divided, which is called the *index rod*, and of this we require only one single rod.

Multiplication by Napier's Rods.—First lay down the index rod; then on the right of it set a rod whose top is the figure in the highest place of the multiplicand; next to this, again, set the rod whose top is the next figure of the multiplicand, and so on in order to the first figure. Then the multiplicand is tabulated for all the nine digits; for in the same line of squares standing against every figure of the index rod, we have the product of that figure; and therefore we have no more to do but to transfer the products, and sum them. But in taking out these products from the rods, the order in which the figures stand obliges us to employ a very easy and small addition. Thus, begin to take out the figure in the lower part, or units' place, of the square of the first rod on the right, add the figure on the upper part of this rod to that in the lower part of the next, and so on, which may be done as fast as we can look on them. To make this practice as clear as possible, take the following example: To multiply 4768 by 385. Having set the rods together for the number 4768 (fig. 2) against 5 in the index, we find this number by adding, according to the rule.....23840
Against 8, this number.....38144
Against 3, this number.....14304

Total product.....1835680

To render the use of the rods yet more regular and easy, they are kept in a flat square box, the breadth of which is that of ten rods, and the length that of one rod, as thick as to contain six, or as many as may be required, the capacity of the box being divided into ten cells for the different species of rods. When the rods are put up in the box (each species in its own cell distinguished by the first figure of the rod set before it on the face of the box near the top), as much of every rod stands without the box as shows the first figure of that rod; also upon one of the flat sides without, and near the edge, upon the left hand, the index rod is fixed; and along the foot there is a small ledge, so that the rods when applied are laid upon this side, and supported by the ledge, which makes the practice very easy. But in case the multiplicand should have more than nine places, the upper face of the box may be made broader. Some make the rods with four different faces, and figures on each for different purposes.

Division by Napier's Rods.—First tabulate the divisor; then we have it multiplied by all the digits, out of which we may choose such convenient divisors as will be next less to the figures in the dividend, and write the index answering in the quotient, and so continually till the work is done. Thus 2179788, divided by 6123, gives in the quotient 356. Having tabulated the divisor 6123, we see that 6123 cannot be had in 2179; therefore take five places, and on the rods find a number that is equal or next less to 21797, which is 18369; that is, three times the divisor. Wherefore set 3 in the quotient, and subtract 18369 from the figures above, and there will remain 3428; to which add 8, the next figure of the dividend, and seek again on the rods for it, or the next less, which will be found to be five times; therefore set five in the quotient, and subtract 30615 from 34288, and there will remain 3673, to which add 8, the last figure in the dividend, and finding it to be just six times the divisor, set six in the quotient. Thus,

6123)2179788(356.

NAPLES.

Naples.

THIS whole kingdom is frequently denominated the kingdom of the Two Sicilies, being situated on both sides of the Straits of Messina, and divided into two portions, commonly distinguished by the natives, Naples, or the continental part, as *Dominj al di quà del Faro;* and Sicily, or the island part, as *Dominj al di là del Faro.* Although the history of this kingdom forms a material part of that of Italy, and is treated of under that article in this work, yet a short abstract of the course of events seems necessary to connect the important parts there noticed.

In the earliest period of the history of Rome, this part of Lower Italy was peopled by a rude people, called the Ausonians, to whom were subjected other tribes, as the Lucanians and the Bruttians, occupying the mountainous districts of the Abbruzzi, and the Samnites. The country on the eastern coast was called Apulia, and that on the western Calabria. The Greeks established colonies, but chiefly on the sea-shore, and hence the name of Magna Græcia was given to it. The dominion of Rome over Lower Italy began with the subjugation of Tarentum by Fabricius, which was defended by Pyrrhus king of Epirus, but surrendered in the year 273 before our era. It continued till the dissolution of the western Roman empire, in the year 476, an appendage to Rome; but then came under the subjection of the Ostrogoths. About the middle of the sixth century both divisions of the kingdom fell under the government of the emperor of Constantinople, to each of which a separate commander was assigned, called Duke, subordinate to the exarchs of Ravenna. Contests continually existed between these exarchs and the state of Lombardy, in Upper Italy, out of which gradually arose, in the ninth century, several independent states, which obtained the titles of dukedoms, such as Salerno, Capua, and Tarentum, and, above all, Beneventum; and also some republican cities, amongst which the most celebrated were Naples, Amalfi, and Gaëta.

At this period, the Saracens, who had previously seized on Sicily, landed on the continent, and contended for the mastery over Calabria. They seized on the city of Bari, and continued their hostilities till they were defeated by the emperor of Germany, who made himself master of Beneventum; but the country continued in an agitated state, from the furious contests of the three parties of Germans, Greeks, and Arabians, whose fierce and plundering habits produced the greatest calamities in the beautiful country for which they fought. In this state of affairs, during the eleventh century, some warlike adventurers of the Norman race offered their assistance to a Grecian duke, Sergius, against Pandorf, the German prince of Capua, and received as a reward a tract of land, on which was built the city of Aversa, where, in 1029, Rainulf, the first Norman count, established himself. Other bodies of bold and greedy Normans soon arrived, with the twelve sons of Count Tancred of Hauteville, in Lower Normandy, at their head. Amongst these young men was one most remarkable for his bravery and sagacity, Robert Guiscard, who drew around him the stoutest of the peasantry, and of them formed a band of most expert warriors. With great prudence, he accepted, as a feudatory of the pope, the district of Apulia, which he had conquered in 1053, and promised to the other Normans the same title to the lands which they should seize upon in Calabria and in Sicily. Seven years after this, he assumed the title of Duke of Apulia and Calabria.

Roger, a younger brother of Robert, in 1072 subdued the island of Sicily, and, after the death of Robert and of his sons, united in himself the whole territory held by the house of Hauteville, in which he was confirmed in 1098, by an extraordinary bull of Pope Urban II. which gave to him and to his successors the highest spiritual power in his kingdom beyond the Straits of Messina. Naples.

Roger II., who succeeded his father, reduced the whole of Lower Italy to a state of subjection by the year 1130, having then secured to his dominions the great, free, and commercial cities of Capua, Amalfi, and Naples. At this period the pope conferred upon him the title of king of Apulia, Calabria, and Sicily, which he soon exchanged for that of king of the Two Sicilies. He acknowledged himself as a feudatory of the holy see, and agreed, as an acknowledgment of his allegiance, to present annually a horse and a purse of ducats.

The union of the two kingdoms continued during a century and a half. On the continent the Lombard law was adopted, but in the island the feudal law of France was exercised. The city of Palermo, in Sicily, was, during the whole of this period, the royal residence.

William, surnamed the Good, the grandson of Roger II. died in 1109, and with him the family of Tancred became extinct; upon which the Emperor Henry VI. of the house of Hohenstauffen, claimed the kingdom in right of his wife Constantina, the daughter of Roger II. The Sicilians, however, abhorring German rule, chose Tancred, a natural son of Roger, and, on his premature demise, his son William, a minor. Henry invaded the country, and exercising great severity, reduced it to his authority. He also died early, and was succeeded by his son Frederick II. who removed the seat of government from Palermo to Naples.

The neighbourhood of the imperial house was an eyesore to the popes, and hence Urban IV., after the death of the Emperor Conrad in 1254, availed himself of his feudal authority, and granted the kingdom of the Two Sicilies as a fief to the brother of Louis IX. of France, Charles of Anjou, who, after some opposition, took possession, and ruled the country with an iron sceptre. The oppressed and discontented people applied to the pope for redress, but without effect. Upon this, John de Procida, a nobleman of a Salernian family, a person endowed with many estimable qualities, and of great penetration and perseverance, resolved to put an end to the sufferings of Sicily. His whole estate had been confiscated on account of his strong attachment to the Hohenstauffen family. In execution of his plans of revenge, he first applied to Peter, king of Aragon, who had married Constantina the daughter of Manfred, for assistance. Peter showed a disposition to assist him, but could do nothing, from the want of pecuniary means, towards obtaining the Sicilian throne. Procida undertook to procure those means, and, properly authorized by Peter, first visited Sicily, where he found all prepared to resist Charles, and where he encouraged the hope of revenge. He then proceeded to Constantinople, and presented himself to the Emperor Palæologus, who had been alarmed by Charles with threats of invasion, and from whom he obtained promises of a large sum to be sent to Aragon. Having received the money, he returned to Peter, who immediately commenced warlike preparations, on the pretext of making an attack upon the Moors in Africa. This awakened some suspicion in Charles, but he so fully relied on the security of his possession, that he neglected to make due preparations.

Peter, with his troops, crossed over to Africa, and there made feigned demonstrations of hostility, waiting to see if

Naples. the Sicilians would rise in insurrection against the French, as they had engaged to do.

On Easter Monday, the 30th of March 1332, the inhabitants of Messina flew to arms at the sound of the vesper bell. A dreadful massacre ensued, in which all the French were put to death. In their rage the inhabitants sacrificed all, not excepting the aged, the females, and the children; and even those women who had connected themselves with Frenchmen were likewise murdered. This horrible event has ever since been known by the name of the Sicilian Vespers. The other cities of Sicily remained a short time in tranquillity; but before the end of April they followed the example set in Messina, and wherever a Frenchman could be found he was instantly put to death.

As soon as Charles received the horrible intelligence, he hastened from Orvieto, where he was on a visit to the pope, to the city of Naples, and having collected his whole forces, prepared to pass over to Sicily. In July, he appeared before Messina, which was ready to surrender on conditions; but as he required unconditional submission, the spirit of the inhabitants was so roused, that they resolved on a defence, which was carried on with the most energetic courage, even the women and children partaking with the men in the dangers, as well as the privations and sufferings, of a siege.

Whilst the siege was in progress, intelligence was received that Peter of Aragon had landed at Trapani with an army of 10,000 foot soldiers and 800 mounted men at arms, and that Palermo had received him with rapturous joy. Charles, disturbed by this occurrence, became also alarmed for the state of Calabria, and having instantly embarked his troops, leaving his military stores behind him, sailed across the strait; but before he reached the continent his fleet was attacked by that of Peter, under the command of his admiral, Roger de Loria, who captured twenty-nine of his vessels, and then ravaged the coast of Naples. Peter was received with joy in Messina, and assumed the government, although the pope issued a bull placing him and the Sicilians under the ban of the church. The next year Constantina arrived with her sons, and was acknowledged as the legitimate inheritor of the crown, which it was then settled should descend to her second son James. Although Charles continued to make attempts to regain his authority in Sicily, they were all unavailing. Contrary to the usual practice of kings in that day, he discovered great personal hostility to Peter, and even charged him with treachery, hoping thus to produce a single combat. The French, however, lost Sicily, and James was firmly seated on the throne. In consequence of this, the two kingdoms were separately ruled during a hundred and sixty years. Whilst the Spanish family ruled the island, the continent was under the subjection of Charles of Anjou, who agreed to hold it as a fief of the papal see, and to pay a yearly tribute of eight thousand ounces of gold.

Robert, the great-grandson of Charles, who in succession filled the throne of Naples, was, in the year 1307, elected king of Hungary by the states of that country. After his death, in the year 1343, in the reign of his granddaughter Johanna, great commotions broke out in Naples. She had married Andrew duke of Calabria, who wished to be acknowledged as king, and is said to have intrigued with that view. He was however murdered, not without strong suspicion that his wife had been participator in the crime. Owing to this charge, and the notorious profligacy of her conduct with other men, the pope, Urban VI., conferred the crown of Naples upon Charles of Durazzo, an Hungarian, who had married a sister of Johanna. He was a short time owned as king of Naples and Hungary; but was assassinated in the latter kingdom about a year afterwards. Two competitors for the crown appeared in Naples; one the son of Durazzo, and the other an adopted or illegitimate son of Johanna. The son of Durazzo, named Ladislaus, after some struggles, conquered Louis of Anjou, the son of Johanna. He also carried on other military operations with great vigour, made himself at one time master of Rome, and aimed at the sovereignty of all Italy; but his projects were terminated by death, in the year 1414. His sister, Queen Johanna II., who succeeded him, adopted King Alphonso V. of Aragon as her heir in 1420; but when he had ascended the throne, a rival appeared in the person of the French prince Louis V. of Anjou, who was successful in his military expeditions, and at length, in 1458, drove Alphonso out of the kingdom. This created jealousies between France and Spain, which, towards the end of the fifteenth century, set the whole of Italy in flames. The contest was carried on with great bitterness, and for a time with varied success, whilst the prospect of the final issue remained doubtful. But at length the crafty king of Aragon, Ferdinand the Catholic, in 1504, gained the complete mastery of the whole of the kingdom of Naples. Naples.

During the two succeeding centuries both portions of the kingdom of Naples remained under the government of the kings of Spain. In the former of these centuries, the continued agitation between the people, the nobles, and the crown, had begotten a kind of constitution; and some assemblies or parliaments, which had originated with the house of Anjou, were instituted, and convened both in Naples and in Sicily. The feudal system was introduced; and the barons continually obtained an extension of their privileges, especially the power of life and death over their vassals, by granting which, the successive monarchs calculated upon securing their service in the wars. By this the people were sunk in the greatest misery, and at no time could the Neapolitans make any successful opposition to foreign invaders. The aristocracy were under subjection to the higher ranks of their own body; and a general corruption of morals, especially as regarded the intercourse of the sexes, which had been introduced by the two profligate queens, Johanna I. and II., prevailed amongst all classes. After the Spanish family was firmly seated, few meetings of the assembly of the states were convened either in Naples or in Sicily; and the viceroys managed matters so, that only committees of the ancient states interfered with public business, whilst the city of Naples had almost the whole administration centred within itself, but under the absolute control of the viceroy. By such means the power of the crown was gradually extended, but could only be maintained by very heavy taxation. The imposition of new taxes, and the oppressive modes of enforcing the payment of them, led sometimes to turbulent scenes in the capital, most of which were speedily suppressed; but one of them was of so singular a character as to deserve a short relation.

In the year 1647 it was thought necessary to impose some tax upon all fruit sold in the city; which, being in the summer the chief food of the poor, caused great uneasiness, but no immediate insurrection. A fisherman of Amalfi, named Masaniello, whose wife had been recently detected in smuggling some meat into the city, and fined for it, had conceived an implacable hatred against the suggesters, the farmers, and the collectors of the new tax. He was a powerful speaker, and a leader of one of the parties of the populace who had agreed to have a sham fight upon a festival. On that day he first roused the populace, and excited them to destroy the office where the tax was collected, and the dwellings of those who had proposed or farmed it. In the course of the rioting, the viceroy, instead of ordering the Spanish and German guards to suppress the disturbance, fled, and was personally insulted; but at length he escaped to a sanctuary, where the archbishop joined him; and they conjointly issued a notice that all taxes on pro-

Naples. visions should be abolished. Besides this, an attempt was made to gain Masaniello by an offer of a pension. But, either from patriotism, or from the vanity of increasing his influence with the mob, he refused to accept the offer, declaring that if the viceroy kept his word he would find the people obedient subjects.

On the following day, however, being joined by some more of the popular leaders, the followers of Masaniello committed some violent outrages, which induced the viceroy to enter into a kind of treaty with this leader, who, though half naked and in rags, found himself at the head of 100,000 armed followers, filled with fury. Some of his followers having been purchased by the court, agreed to kill him, and whilst he was in treaty with the viceroy and archbishop, the attempt was made; but it failed, and those who were thus shown to be traitors to their chief were instantly put to death. The viceroy himself with difficulty escaped the same fate; but the power of Masaniello was greatly strengthened, and he exercised it with much appearance of fairness and impartiality. The viceroy was fearful that the French might take advantage of the commotion, and create some annoyance, and therefore hastened to make peace with the leader of the insurrection. On the fifth day after it broke out, a treaty was concluded, by which it was stipulated that the taxes imposed since the reign of Charles V. should all be abolished; that in future no new taxes should be levied except by electors; that the people were to elect as well as the nobles; that an act of oblivion should be passed, and the people remain in arms till the ratification of the treaty was completed.

Great rejoicing followed this arrangement. Masaniello having repaired to the viceroy, was appointed captain-general, and induced to change his dress for more appropriate apparel; he also received a present of a gold chain. The following day he began to exercise the authority of a sovereign, judging all crimes, whether civil or military, and ordering to instant execution on a gallows he had erected, those whom he had doomed to death. It is said that in these summary proceedings no innocent person suffered and no guilty person escaped. His grandeur was but of short duration. In two or three days he became distracted and delirious, and committed some most extravagant actions; and on the 18th of July he was put to death, with the consent, if not by the orders, of the viceroy.

The tumult did not however terminate with the death of its author. In the capital, as well as in all the other cities of the kingdom, the people rose and drove out those Spaniards who were found in them. The Duke of Guise, who happened to be at Rome, was induced, at the instigation of the pope, to offer his services to the Neapolitans against the Spaniards; and to this he was further encouraged by having some distant pretensions to the throne. The Spaniards in the mean time made a vigorous attack on the city of Naples, but were repulsed by the people, who thereupon formally renounced their allegiance to the Spanish family. In a short time, however, a new viceroy, Count d'Oniate, arrived from Spain. He took the city by surprise, made the Duke of Guise prisoner, and thus frustrated all the designs of France against the Spanish power in Naples. Naples.

From that time the whole of the united kingdom continued under the dominion of Spain, till the war of the succession broke out, in the beginning of which, in 1707, it was taken by Prince Eugene, and continued subject to the Emperor till the peace of Utrecht in 1713. By this peace, confirmed by the quadruple alliance of 1718, the two divisions of the kingdom were separated; the continental portion being delivered to the house of Austria, or rather to the Emperor Charles, who had been competitor with Philip of Anjou for the whole Spanish dominions; whilst the island of Sicily was given to the Duke of Savoy, who afterwards attained the dignity of king of Sardinia.

In the year 1717 Philip V. of Spain, at the instigation of his minister Cardinal Alberoni, seized upon Sicily, but in 1720 gave it back to Austria, whilst the Duke of Savoy was satisfied with the island of Sardinia. Thus the two parts were again united under one head, and were ruled by Austrian viceroys until the war which broke out in 1733, respecting the election of a king of Poland. At that period Spain invaded Naples and Sicily, and secured both divisions; and, at the peace of Vienna in 1735, it was settled that the territory should be held by the Infant Don Carlos. When, on the death of King Charles IV. in the year 1759, Don Carlos succeeded to the throne of Spain, the kingdom of the Two Sicilies was delivered over entire to his third son Ferdinand, with a guarantee or stipulation that it should never in future be again united to the Spanish monarchy.

The kingdom of Naples partook of the calamities which were inflicted upon all Europe by the French revolution; but as the history of these events is already treated of in former parts of this work, under the articles FRANCE, GREAT BRITAIN, and especially ITALY, it is not necessary here to do more than refer to them. The transactions occasioned by revolutionary attempts made since the fall of Bonaparte are pretty fully narrated under the article ITALY.

This kingdom, as a whole, comprehending both the continental and the island portion, is bounded on every side by the sea, except that on the north; and in the continental portion it is in contact with the territory of the church. It extends in north latitude from 35. 40. 10. to 42. 51., and in east longitude from 11. 54. to 18. 34.; but some few of the islands, especially Lampedosa, extend beyond these limits.

The two great divisions are commonly distinguished by their position regarding the narrow sea which divides them, called the *Faro* or Straits of Messina: thus the continental part is described as *Dominj al di quà del Faro*, and the island part as *Dominj al di là del Faro*.

The following table shows its actual state according to the divisions before noticed.

CONTINENT.					
Provinces.	Extent in English Square Miles.	Population.	Cities.	Towns.	Villages.
Naples, the city of that name included.....	193	745,390	8	5	77
Terra di Lavoro.....	2,430	675,349	30	22	389
Citeriore.....	2,717	492,228	31	18	332
Ulteriore.....	1,953	370,930	30	22	114
Carry forward.....	7,293	2,283,897	99	67	912

Naples.

CONTINENT—(*Continued.*)

Provinces.	Extent in English Square Miles.	Population.	Cities.	Towns.	Villages.
Brought forward.....	7,293	2,283,897	99	67	912
Molise.....	1,261	331,328	9	16	77
Abruzzo Ulteriore I.....	2,289	185,144	27	14	93
Abruzzo Ulteriore II.....	1,172	283,694	17	21	61
Abruzzo Citeriore.....	1,755	266,948	12	24	103
Capitanata.....	3,854	296,793	16	25	101
Bari.....	1,780	425,706	24	27	175
Otranto.....	2,767	357,205	21	32	112
Basilicata.....	2,604	458,242	31	30	109
Calabria Citeriore.....	3,654	385,360	37	29	108
Calabria Ulteriore II.....	1,542	250,802	22	28	107
Calabria Ulteriore III.....	1,854	333,017	17	32	88
	31,825	5,858,136	332	345	2046

THE ISLAND.

Provinces.	Extent in English Square Miles.	Population.	Cities.	Towns.	Villages.
Palermo.....	1,782	467,778	61	6	16
Messina.....	2,018	290,451	54	9	19
Catania.....	1,848	335,647	53	11	35
Siracusa.....	1,364	233,956	47	7	21
Caltanisetta.....	1,584	168,525	31	8	4
Girgenti.....	1,672	226,114	66	9	8
Trapani.....	1,078	171,396	40	4	7
	11,346	1,893,867	352	54	110

The above enumeration of the inhabitants of the continental part of the kingdom is taken from a minute account of the year 1831. Since that time, an official document, which gives only the final results up to the beginning of 1835, states the population of that part to be then 5,883,273 persons.

The disproportion between the number of cities and that of the towns and villages in the island, as compared with the continent, may be attributed to the ancient state of the latter. Sicily had been partly peopled with colonists from Greece. These had established governments, in some measure independent, but always jealous, and frequently in a state of hostility with their neighbours. Thus fortified places were generally constructed by each of the small communities, as places of refuge to which the cultivators repaired, and where they most commonly dwelt. Such places still retain the titles of cities, though many of them have very few inhabitants, and their defences are mostly in a dilapidated state.

As this kingdom possesses so large an extent of sea coast, our attention is naturally first drawn to a description of it; and this leads us to notice the celebrated strait, which has been depicted by the poets of antiquity in most terrific colours, but whose horrors have been so overcome by the progress of nautical science. Captain W. H. Smyth, a scientific officer, long occupied in surveying the Mediterranean Seas, took accurate measurements by theodolite angles, with a good base line, of the distance across this passage, at four different points. The shortest distance, from the village of Ganziri to Point Pezzo, is three thousand nine hundred and seventy yards; the next in length is from Messina light-house to Point del Orso, five thousand four hundred and twenty-seven yards; the next, from Faro Point to the castle of Scylla, is six thousand and forty-seven yards; and the last, from Messina light-house to the cathedral of Reggio on the continent, is thirteen thousand one hundred and eighty-seven yards.

The currents in the strait are numerous and various. In settled seasons there is a central stream running north and south, at the rate of from two to five miles an hour, and which, though properly speaking only a current, when uninfluenced by strong winds, is governed by the moon. On each shore there is a counter or returning set at uncertain distances from the beach, often forming eddies to the central current; but in very fresh breezes, the lateral tides are scarcely perceptible, whilst the main one increases, so as to send at intervals slight whirlpools to each shore. There is an uncertain rise and fall of a few inches in the tide, but at the equinoxes it amounts to eighteen or twenty inches. There is usually an interval of from fifteen to fifty minutes between the changes, and the tide runs six hours each way. In light breezes the current may be stronger than the ship's effort, and, by turning her round, often alarms a person unacquainted with the phenomenon, although there is no actual danger. The greatest risks, however, are occasioned by the heavy gusts of wind which at times rush down through the openings of the mountains on either side, and often prove dangerous to small vessels.

This passage has long been clothed with imaginary terrors; yet as the Athenians, and the Syracusans, and the Locrians, and the Rhegians, fought in it, it could not have

Naples. been considered so fearfully horrible by ancient sailors as by ancient poets; and the language of the former would probably have borne a very different tenor from the embellishments of the latter, notwithstanding that the passage through it might have been an affair of some moment with their small vessels and inexperienced seamen.

Nelson with his fleet passed through this channel; but, in applauding him for doing so, and attributing to him the merit of first attempting it, his biographers have overlooked the gallant Walton,[1] who had, nearly a century before, passed securely through.

There is a curious aërial phenomenon in the Strait of Messina, noticed by the ancients, and denominated the Fata Morgana by the Sicilians, who believe that the spectacle is produced by the fairies. Most extraordinary accounts of this phenomenon have been given by those who have witnessed it, but more especially by Father Angelucci, whose account is thus quoted by Swinburne: "As I stood at my window, I was surprised with a most wonderful and delectable spectacle. The sea that washes the Sicilian shore swelled up and became for ten miles in length like a chain of dark mountains; whilst the waters on the Calabrian shore grew quite smooth, and in an instant appeared as one clear polished mirror, reclining against the ridge. On this glass was depicted, in *chiaroscuro*, a string of several thousand pilastres, all equal in altitude, distance, and degree of light and shade. In a moment they lost half their height, and bent into arcades like Roman aqueducts. A long cornice was next formed upon the top, and above it rose innumerable castles, all perfectly alike. These soon split into towers, which were shortly afterwards lost in colonnades, then ended in pines, cypresses, and other trees, even and similar."

This deception is only to be seen under a peculiar concurrence of circumstances. The spectator must stand with his back to the east, on some elevated place behind the city, which commands a view of the whole bay, beyond which the mountains of Sicily rise and darken the background of the picture. The winds must be hushed, the surface smooth, the tide at its height, and the water pressed up by currents to a great elevation in the midst of the channel. All these events coinciding, as soon as the sun surmounts the eastern hills, behind the city of Reggio, and rises high enough to form an angle of forty-five degrees on the water before that city, every object existing or moving in Reggio will be repeated upon this marine looking-glass; each image will pass off rapidly in succession as the day advances, and seem to be carried down the wave on which it appeared. Thus the parts of this moving picture will vanish in the twinkling of an eye. Sometimes the air is so impregnated with vapours, and undisturbed by the winds, as to reflect objects in a kind of aërial screen, rising about thirty feet above the level of the sea. In cloudy weather they are drawn on the surface of the water, bordered with fine prismatic colours.

On this subject, which so much engaged the attention of the ancients, Captain Smyth, a cool and accurate observer, says, "I much doubt the accuracy of the descriptions I have heard and read, as I cannot help thinking that the imagination strongly assists these dioptric appearances, having never met with a Sicilian who had actually seen any thing more than the loom or *mirage* consequent on a peculiar state of the atmosphere; but which, I must say, I have here observed many times to be unusually strong. It is spoken of by some as a luminous ignescent phenomenon, infallibly predictive of an approaching storm."

Naples. In a maritime survey of the Neapolitan shores, we begin on the western side of the continent, where the dominions of the kingdom join the papal territory. The whole coast, though ill furnished with good harbours for large vessels, has some deep indentations and capacious bays, with good anchorage. Of these bays the most northern is that of Gaeta, which is capacious, with good anchoring ground at a depth of from twelve to fourteen fathoms at the north-west of the fortress of that name, situated on a promontory. It is very strong, and is defended by a citadel; notwithstanding which it was taken by the French in 1797, and by the English and their allies in 1799. A little to the south of the bay of Gaeta, the small rivers Erivando, Garigliano, and Volturnus empty themselves into the sea.

The next bay to the south is that of Naples, distinguished at its entrance by the islands of Ischia and Procida to the north-west, and by the island of Capri and the promontory of Campanella to the south-east. The breadth of the entrance between these points is five leagues, and vessels ride in security; but when the wind blows strongly from the north-east, it causes a very considerable swell. The bay of Naples is considered as the most beautiful and interesting indentation of the sea that the world presents. Its curiosities, both of nature and art; its remains of classical antiquity; its varied and wonderful scenery; its volcanic eruptions and earthquakes; its cities, founded, established, and at length overwhelmed, in all the pride of luxury; its mountains converted into lakes, and lakes into mountains; these form a combination of circumstances and events which is nowhere else, upon an equal space, to be found; and its shores have therefore exercised the descriptive pens of many writers.

On the north-west side of this bay, between Cape Miseno and Pozzuoli, the coast is sterile and mountainous. Cape Miseno is a block of tufa or limestone of considerable height, and was evidently a volcano, the crater of which may be traced from the south, though nearly worn away by the action of the sea. In the interior of the mountain are vast caverns and subterranean streets, supposed to have been magazines for the Roman fleets, which rendezvoused in a port sheltered by the cape, the piers of which are still to be seen level with the water. The remains of the town of Misenum, situated on the cape, consist of a theatre, and the ruins of some monuments. On the north of the cape is the Porto di Miseno and Mare Morto, known to the ancients as *Acheron*.

The ruins of some grand buildings on the shore and under water, at two miles and a quarter to the northward of Cape Miseno, exhibit the site of the voluptuous Baia; opposite to which, on the east, is Pozzuoli, and within half a mile of the latter is the Solfatara, or Sulphur Hill. The vapours which exhale from the various craters, from the Solfatara, from the lakes and hot springs, and from the marshes formed by the waters which anciently flowed in superb aqueducts, infect the atmosphere of these shores; and hence between Cape Miseno and Pozzuoli there is scarcely a habitation. The more healthy situation of the latter, on a point of land advancing into the sea, has retained some inhabitants; whilst beyond it to the eastward the scene improves, and the little island of Nisita is seen covered with verdure.

The Lago d'Averno, and the Lago Lucrino, at the bottom of the bay of Baia, to the north-west, are surrounded by elevated grounds, and, having in some parts a considerable depth, they might be formed into a good harbour, by cut-

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[1] This was the officer who, after the action between Sir George Byng and the Spanish fleet, was detached in pursuit of six sail of the line and some smaller ships, that had escaped, and reported his success in the following laconic terms: "Sir,—We have taken or destroyed all the enemy's ships and vessels on the coast, as per margin. Yours, &c."

Naples. ting a communication to the sea of less than half a mile in length. The poisonous qualities ascribed to these waters by the ancients no longer exist; for they now possess fish in abundance, the birds fly over and men bathe in them with impunity. The Lago Lucrino, which is to the south of the Averno, covers three or four acres, and is distant from the sea only about ten yards, a sluice forming the communication between them.

In rounding the north shore towards the city of Naples a new scene opens to the eye, the shore being thickly dotted with noble buildings in the midst of beautiful plantations. That city presents itself rising in the form of an amphitheatre on the side of a mountain, and beyond it a vast plain, richly cultivated, and watered by the winding little river Sabeto. On the eastern side of the bay, Vesuvius, with its double summit, rises in majestic solitude from the surrounding plain; and two thirds of its height are cultivated, the summit only being bare of vegetation. On its sides and at its base are scattered villages and villas, built on the lava of successive eruptions, which time has converted into the most fertile of soils. But whilst the eye rests with complacency on this smiling prospect, a sentiment of melancholy cannot fail to accompany the remembrance that, many fathoms deep, lie buried the palaces and gardens of some of the ancient masters of the world.

Portici, three miles from Naples to the south-east, is built over, or nearly over, Herculanum, which, as well as Pompeii, has for many years been exhuming or uncovering, so that now the traveller, with a feeling of astonishment and veneration, walks in streets and enters houses which have been buried for seventeen centuries. These overwhelmed cities are chiefly built of and paved with lava, and beneath their foundations are several alternate strata of this substance and of vegetable soil, in which the remains of plants are discovered; whence it seems highly probable, that long before the establishment of the people whom we call the ancients on these coasts, nations absolutely unknown to them, as well as to us, inhabited this soil, and were driven from it by great physical convulsions.

The south-east and the south shores of the bay of Naples rise perpendicularly, in volcanic cliffs, to a great height; immediately behind which are high mountains, clothed with verdure to their summits, and having their sides decorated with villages. On this side stands Castella Mare, with its little haven formed by a mole, where vessels of war are built; and two leagues farther to the south-west is Sorrento, the ancient *Surrentum*, one of the most handsome towns in the kingdom.

In noticing the islands situated on this portion of the coast, Ischia, already named, first presents itself. It was the *Pithecusa* of the ancients, and consists of one large and several lesser hills, all formed by volcanic eruptions, and abounding in metallic substances. It has many hot springs, and is fertile, producing figs, oranges, pomegranates, chestnuts, and aloes. It is five and a half miles in length, and the hill called Monte Epomeo, in the centre, is of great height. It was formerly a volcano, a dreadful eruption from which is recorded to have happened in the year 1301. The town is on the eastern side, being well fortified, and protected by a citadel connected with it by a stone bridge four hundred yards in length, near to which vessels may anchor securely in between three and four fathoms water, fastened to the shore.

Between Ischia and Cape Miseno are the islands of Procida and Vivara, between which there is secure anchorage for vessels in four fathoms water, open only to south or south-east winds. The first of these is two miles and a fourth across, being partly covered by the town, whilst the rest produces vines, figs, and orange trees. The latter is about a mile in length, and chiefly occupied by fishermen.

After passing to the south by the island of Capri, the extensive gulf or bay of Salerno opens. In this, covered by some islets, but at a distance of three leagues, stands the town of Amalfi. It was once celebrated for that trade to the Levant which was afterwards concentrated in the city of Venice. It was at this place that the mariner's compass was perfected by Flavio de Gioja in 1302. The road is open to the south; but vessels are secure from such winds as blow at any point between north-west and south-west. Not far from thence is the city which gives its name to the bay. Salerno is large and populous, and stretches along the beach, with a ruined castle on a hill behind it. The road is much exposed to northerly winds; but there is a mole, behind which small vessels may find shelter. The country near it is fertile and pleasant, presenting a range of hills covered with olive groves, orchards, and corn-fields.

From Salerno to Cape Licosa, the southern point of the bay, the coast continues with a smooth sandy beach, on which is the ancient Pæstum, with the remains of its antiquated fortifications, more than two miles in circumference, and the ruins of several beautiful temples, and other public buildings. From Licosa, the land trends towards the south-east, with no good port, but safe anchorage off Palenuro, by which town is a communication with the city of Policastro, the ancient *Buxentum*, but now a place of small importance. In proceeding still southward are found the gulf or bay of St Euphemia, and that of Gioja. They both have some anchoring places near small towns, but no port; and the whole coast is rocky and foul. All this part of the coast has suffered severely from earthquakes, but particularly from that most ravaging one which occurred in 1783, when most of the towns were destroyed. These bays are followed by the strait already noticed, on the northern point of which is the town of Scylla, standing partly on the shore, but the greater part above the rocks. The streets are narrow, and nine different rows of houses rise the one immediately above the other. The dangers arising from an approach to this place have been long proverbial; but the only real hazard is when the current and wind are so opposed as to impel a vessel towards the rocks. Scylla was dreadfully injured by the memorable earthquake of 1783, when a part of its promontory was thrown into the sea.

In the Faro of Messina, the only place of importance on the continental side, is the city of Reggio, celebrated for its manufactures of stockings, gloves, waistcoats of thread and of silk, and some other articles. The environs abound in oranges, citrons, mulberries, and grapes, and produce some sugar-canes.

On clearing the Faro, and proceeding round to the Adriatic, Cape Spartivento, the ancient promontory of Hercules, is passed, being the southernmost continental spot of the kingdom, and situated in latitude 37. 56. north. From thence to Cape Rizzuto, the land forms an irregular concavity. It has several small towns, villages, and towers, near the coast, but no harbour or anchoring place, except with the wind off shore; the water is very deep close to the shore, but there is no secure part where vessels can obtain shelter, in case of finding themselves on a lee shore with a strong gale of wind. Cape Rizzuto has a light tower upon it; and there is another on Cape Nan, fourteen miles distant from it. Not far from the latter cape stands the port of Crotona, a poor place, in an unhealthy situation, from which some corn and cheese are exported, and only remarkable for its having been the place where the school of Pythagoras flourished.

The great gulf or bay of Taranto, to the eastward, extends across about sixty-two miles from the extreme points which form it, namely, Point Alice to the south, and Santa Maria di Leuca to the north. No part of the western shore of the great gulf affords any harbour or shelter

Naples. for a vessel with the wind blowing on the shore; but there are many villages and watch-towers on the coast, and a great number of small rivers. The city of Taranto stands in the bottom of the gulf, and had once an excellent port, which is now nearly choked up, from neglect. It has about 18,000 inhabitants, with a fort of some strength. It stands on an island connected with the mainland by two bridges. It has some extensive fisheries. Another town stands on the eastern side of the gulf, now called Gallipoli, but known in antiquity as *Callipolis*. Near to it is a road-stead, with good anchorage, within gun-shot of the town; but farther in shore the ground is rocky, and there are several shoals. The trade of this town consists chiefly in the export of oil, well known by its name; and in cotton, which is grown in the neighbourhood. From Gallipoli to Cape di Leuca are eight leagues, and from thence seven more to Cape Otranto, the easternmost point of land in Italy. The port of Otranto is capable of affording shelter to vessels when the wind is south or south-west; but a northerly wind blows right into it. It admits vessels of 150 tons, and is a place of some trade. To the north-west, on this shore, between Cape Cavallo and Cape Gallo, is the city of Brindisi, the *Brundusium* of antiquity. This was once a celebrated port, and that from which the Romans usually crossed in their way to Greece; mostly at *Dyrrachium*, the modern Durazzo. Both places are remarkable from the war between Cæsar and Pompey. Brundusium was once the best harbour on this side of the Adriatic; but in the fifteenth century the Prince of Taranto sunk some ships in the middle of the passage, to prevent his enemies from entering, and thereby formed a resting place for sea-weeds and sand, an accumulation of which has choked it up. Stagnant water at length produced a pestilence which carried off two thirds of the inhabitants. The present population scarcely exceeds 8000 persons.

The coast from Brindisi proceeds north-west, on which, on rather low ground, is the city of Monopoli, containing 10,000 inhabitants. It is open to the sea, and is defended by a castle. Not far from it are the towns of Mola and Polignano, and then comes the city of Bari, the largest place on this side of the kingdom. It has good anchorage without, and a small haven, into which vessels can enter. It is a fine city, with 30,000 inhabitants, who export large quantities of wine, oil, and soap. Beyond this is Barletta, the *Barduli* of the ancients, once an elegant and populous place, but now much dilapidated. It has some trade in the export of wine, oil, salt, corn, almonds, and liquorice. The gulf or bay of Manfredonia is next to Barletta, in the bottom of which is the city of that name. It was founded as late as the year 1526, and at present contains about 6000 inhabitants, who export corn and salt. It is celebrated for the excellence of its esculent vegetables, particularly its lettuces. Fish is abundant, and very cheap. On the western side of the bay is the Laguna di Salpi, the *Palus Salapina* of antiquity, a salt lake eleven miles in length, from which much culinary salt is obtained, owing to the evaporation caused by the sun.

Between Manfredonia and the boundary line towards the papal territory there are no harbours, though there are some spots where there is tolerable anchorage. The best is near the towns of Viesti and Rodi, and behind the islands of Dominico and St Nicolo. There are a number of small towns and villages, defended by forts, along a coast low and sandy. The names of the most important are Termoli, Vasto, Ortona, Francavilla, Pescara, and Giulianova. The Neapolitan territory terminates at the river Tronto, a stream which descends from the Apennines.

It has appeared necessary to take this notice of the sea-coast, because the kingdom of Naples possesses, including the continental and island division, a greater extent of sea-shore than any of the other countries of Europe except the united British kingdoms. The most productive parts of the dominion, as well as the most dense in population, are near the coast; and, in surveying it, the most interesting recollections of classical history are revived or created. For these reasons we shall proceed to pass in review the several shores of the island of Sicily. Naples.

The first appearance of the coast of Sicily is romantic, and it is formed by nature into strong positions of defence. Vessels from the westward generally touch first at Cape St Vito, the northernmost point, in north latitude 38. 13. and east longitude 12. 45. In proceeding eastward from thence there are some strong towers, once maintained as places of alarm, and with a few guns mounted; but of late most of them have been neglected. They serve, however, as beacons, with fires ready to be kindled; and the alarm given by them is sounded along the coasts with conch-shells, similar to the *tuba* of the Romans. Cape St Vito forms one of the points of the Gulf of Castell-a-Mare, an indentation about ten miles in depth, at the bottom of which is the town of the same name, containing 5000 inhabitants, in a highly cultivated district; and near to it are the interesting remains of a Doric temple, with vestiges of an ancient theatre. To the eastward of this is the bay of Palermo, with the city of that name on the western side of the bay. There is good anchoring ground in almost every part of this bay, near to the shore. To the north-east of the city is a fine mole, near a quarter of a mile in length, extending into water of the depth of nine or ten fathoms; and it forms a noble port, capable of containing a great number of vessels. Along the whole, at the most favourable points, there are establishments for the tunny fisheries. The next point on the coast is Cape Zaffarana, which looks like an island; and five miles beyond it are the towns of Mandero and Milicia. In a bay known as the bay of Solento stands the city of Termini, which has some trading privileges, and from which is exported some oil, wine, sumac, corn, and rice; but the anchorage is exposed during two thirds of the year, when the boats must be drawn up upon the beach.

Five miles to the eastward of Termini is the site of the ancient Himæra, celebrated on account of one of the most disastrous battles that history has recorded, and which was subsequently destroyed by Hannibal. Near to it the Fiume Grande, one of the most considerable streams of Sicily, discharges its waters into the sea, through one of the most unhealthy but most fertile districts of the island.

About twelve miles to the east of Fiume Grande stands the city of Cefalu, on a low projecting point of land, under a conical mount, on the summit of which are the ruins of an ancient Phœnician edifice and a Saracenic castle. The city has a fine cathedral, and contains 9000 inhabitants. From Cefalu to Caronia is six leagues. The district is the most extensively wooded with oak, elm, and ash trees of any in Sicily, and most of the trees are converted into charcoal. On the shore there is good anchorage, which continues by the towns of Santa Agata and San Marco, quite to Cape Orlando. Here is a dangerous reef of rocks; but between it and the shore there is good ground, where small vessels may anchor in safety. Cape Orlando is distinguished by the Brolo Castle, a ruinous structure, and a rock between sixteen and seventeen feet in circumference, and twenty feet above the level of the water, behind which a ship may ride in safety, except when a southerly wind blows with great violence.

Next to Cape Orlando is the bay of Patti, a perfectly safe anchorage in all parts except in the centre, where there is a large rock; but as it appears above water, all danger is easily avoided. The unhealthy town of Oliveri stands on the banks of the small river Elicona. From Oliveri a sandy beach extends along a fertile plain studded with

Naples. the towns of Fornari, Barcelona, Pozzo di Gotto, and some villages, and terminates at the promontory and city of Milazzo.

Milazzo, the ancient *Mylæ*, is situated on the southern part of the peninsula or promontory of that name, facing the east. It consists of the upper and lower town, which together contain 8000 inhabitants, who are industrious, and subsist by the export of wine, silk, fruit, soap, red and white argols, corn, olive oil, linseed oil, and tunny fish. A citadel commands the city, the port, and the promontory. This northern coast of Sicily terminates with Cape Rasaculmo, which is a deep sandy bay, with several small streams running into it. The banks are much injured by malaria, but the heights near them are thickly peopled. Off the cape is good anchorage ground, with from twelve to twenty fathoms depth of water.

The eastern coast of Sicily begins at the north with the Faro of Messina, which has been already noticed, and the city of that name. That celebrated vortex known to the ancients as *Charybdis*, but now called Galofaro, is formed at the back of the tongue of land named Braccio di St Rainiere, which is one bank of the harbour of Messina. This whirlpool was said by the ancients to swallow up ships, and upon the return of the tide to throw them up again in broken pieces. Captain Smyth describes it as an agitated water from seventy to ninety fathoms in depth, circling in quick eddies, which seem to be caused by the meeting of the harbour and of the lateral currents with the main current; the latter being forced over in this direction by the opposite point of Pezzo. The risk is proverbial; and at the present day small craft are sometimes endangered by it, and ships of war wheeled round upon its surface; but, with caution, very little danger or inconvenience is to be apprehended from it, especially since a light-house has been constructed.

In our progress westward is Scaletta, a small town of 700 inhabitants; then Cape Grosso, Point St Alessio, and Cape St Andrea, near to the last of which, in a bay of the same name, is the city of Taromina, in a fine situation, but not very healthy; but it has good anchorage ground, in water from eight to thirty fathoms in depth. About two miles beyond it, the Alcantara, one of the most considerable rivers of Sicily, falls into the sea. Near to this is the district of Mascali, which is most fertile, and, amongst other productions, yields annually about 90,000 pipes of excellent wine.

Beyond this, at the distance of five miles, is Point Tocco, formed of a precipitous mass of basaltic lava, converted into a mole, and forming a small port called the Marina of Aci. Not far from it is the city of Aci Reale, standing on extensive streams of lava. It is in a healthy and fertile spot, is clean and well built, and is said to contain 14,000 inhabitants. Another remarkable promontory, three miles from it, Cape Molino, is formed of lava; and the town of La Trezza, near to the latter, is built wholly of that substance, the very dark hue of which, contrasted with the white-washed lintels and door-posts of the houses, has a singular appearance. Near La Trezza are the remarkable rocks called the *Cyclops*, which have a bold and striking appearance; for the basalts that form them are mostly vertical, and consist of prisms of from four to eight sides.

The whole coast from thence, including the great bay or gulf of Catania, may be considered as within the line of the base of Mount Ætna, which towers over every part of it. That base is calculated to extend in circumference about eighty-seven miles, and its summit is ascertained to be 10,870 feet above the level of the sea. The summit is fourteen and a half miles northward from the city of Catania.

The bay upon which Catania stands is seven and a half miles in extent from La Trezza to Cape Santa Croix; the ground is generally clean, and ships may anchor in any part of it during the fine season. The city, originally a Greek colony, has been most dreadfully ravaged by wars, earthquakes, and volcanic eruptions. We avoid noticing the manifestations of volcanic power which have at various periods been exhibited, with the exception of the tremendous one in 1693, in which more than 50,000 persons perished, and the whole of the buildings were destroyed, except a few which were subsequently taken down to carry on the plan laid down for rebuilding the new city. It is now regular, spacious, and handsome. The churches and other public buildings are magnificent, being for the most part constructed of lava, faced with magnesian limestone, and enriched with marble. It is the residence of many of the Sicilian nobility, and has many literary and charitable institutions. The population amounts to about 75,000. The environs of the city, excepting those parts covered with lava, are fertile and well cultivated, but have a black and repulsive appearance. The harbour of Catania is generally filled with small craft, which repair to it for corn, maccaroni, potatoes, olives, figs, silk, wine, almonds, cheese, oil, soda, manna, cantharides, amber, snow, and lava. The beauty of the situation, according to General Cockburn, exceeds all power of description. It is a fine well-built city, close on the sea shore, overshadowed by the gigantic majesty of Ætna, and encompassed by the several minor volcanic hills, which appear like so many branches arising from the parent stock; whilst the placid brilliancy of the sea-view in front, and the solemnity of the inland scenery behind, contribute to form as magnificent a prospect as any part of the island can exhibit.

A little to the south of Catania the river Trachino enters the sea; and near to it is the city of Aguni, with its port of La Bruca, with a harbour looking like a work of art rather than of nature, as the rocks rise vertically to the height of forty or fifty feet. The city of Augusta, after passing Point Grosso Longa, presents itself on a peninsula. It is large, strong, and well fortified; the inhabitants, about 8000 in number, subsist chiefly by collecting salt from some salines near them, and by the export of oil and wine. The western sides of the harbour are watered by several streams abounding with fish. On the same side are the mountains of Hybla, celebrated by the ancients on account of the honey produced on them, especially on those hills called Hybla-Galatea and Hybla-Mægara. The inhabitants still obtain excellent honey, the sale of which is the chief as well as the most profitable trade. There is a fort and a light-house, which, with the cathedral, form the marks for reaching the anchorages; the latter are good, although the inner one is deemed unhealthy.

The next place to Augusta is the city of Syracuse, occupying only one of the four portions included in its extent when in ancient times it was a Greek colony, founded by Corinthians; it is said to have then contained half a million of inhabitants. The whole of the present city now scarcely covers the island of Ortygia. It suffered most dreadfully by an earthquake in 1693, which destroyed a great part of the population; and the present inhabitants do not amount to more than 13,000 persons.

The city constitutes a fortress of considerable strength; and the entrance of the harbour, which is half a mile wide, is defended by a fort on the south of the town. The adjacent country being copiously irrigated, and possessing a marly soil, is exuberantly fertile, producing wheat, oil, hemp, tobacco, fruit, pulse, and several kinds of delicious wines; but, from the marshes of the alluvial plains on the west side, pernicious miasmata have frequently arisen, and occasioned the destruction of human life. The port is a very secure one, easy of access, and sufficiently capacious to admit a large fleet, with good conveniences for shipping

Naples. provisions and water, as was experienced by Lord Nelson, who, in five days, obtained supplies sufficient for his memorable pursuit of the French fleet in the year 1798.

Between Syracuse and Cape Passaro, the southernmost spot in Sicily, is the extensive bay, the northern point of which is Cape Icongo. In the whole of it there is good shelter for large as well as small vessels, which may be compelled to bear up in the channel of Malta by a westerly gale of wind. The anchorage is good in from nine to thirty fathoms of water, with a good holding ground of stiff clay. The places on this bay are Avola and Noto. The former has 7000 inhabitants, who carry on a considerable traffic in wine, corn, almonds, oil, honey, and some sugar made from the only plantation of canes now left on the island. The city of Noto, with 13,000 inhabitants, is within four miles of the shore. It is finely situated and well built, and the country around is fertile; but the air is unhealthy, especially near the river Abysso, the ancient *Hebrus*, which winds through the plain on which it stands. There are, besides, the smaller towns of Vindicari, Marzamemi, and Pechino, the inhabitants of which chiefly depend on the fishery.

That part of the coast of Sicily the direction of which is from south-east to north-west, extends from Cape Granitola in the west, to Cape Passaro in the east. It completes that irregular triangular figure of the island which induced the ancients to bestow upon it the name of *Trinacria*. The coast between the two points here named is generally low and arid, and does not possess a single harbour for large ships, although there are several tolerable summer anchorages. Of these the principal are, Sciacca, Siculiana, Girgenti, Alicata, and Port Paolo; and the secondary are, Palma, Port Nicolo, Terra Nova, Scoglietti, Secca, Pozzallo, and La Marza. The most remarkable headlands of the coast are, Cape St Marco, Cape Bianco, Point Tenda, Cape Scalambra, and Cape Passaro. Towards these the approaches are not so clear nor so deep as those of the northern shores; but ships are safe which by day are not in less than twelve fathoms water, or at night in about twenty fathoms.

The tides, or rather the currents, arising from the constant evaporation and the action of the winds, observe no regularity, rising a foot or two, according to the weather, and the peculiarities of locality and depth. Thus, the north-west winds, raking the shores, produce a strong set to the south-east, whilst the south-west wind, which is very sensibly felt during the vernal equinox, causes strong counter-currents; and at length, on a change of wind to the opposite quarter, the whole body of water rushes with great velocity to the westward. In settled weather, the currents between Sicily and the African shore run to the eastward at the rate of from half a mile to a mile an hour. In the channel of Malta, the current at south-east has been found so strong, that ships have found it difficult to beat up to Maritimo; whilst others, driven to leeward of Malta, have been obliged to carry a press of sail in order not to lose way, until a change of wind enabled them to make the island again.

From Cape Granitola to Cape St Marco there is a long but slender bay, a distance of twenty miles from the two points. It is called the gulf of Tre Fontane. It is of easy access, but has no good shelter except for small vessels. In it, near to Port Paolo, are the solitary ruins of *Selynus* or *Selinuntum*, appearing, at no great distance, like a large city. These extraordinary vestiges of ancient greatness, though only an incongruous mass of shafts of columns, metopæ, capitals, &c. excite great admiration, and attest the mighty exertions of a once energetic people.

From St Marco to Cape Bianco a similar bay extends about fourteen miles, in which there is good anchorage: but it is only safe in the summer months, near the town of Sciacca, the celebrated *Thermæ Selinuntiæ* of antiquity. Naples. It is a poor but large place. The baths are supplied by two springs; one of which is sulphureous and hot, being about 126° of Fahrenheit; the other cool, being about 60°, and impregnated with the saline qualities of the rock from which it springs. The steam-baths of Dædalus are situated on an insulated rock, and have been in use upwards of three thousand years.

About eight miles beyond Cape Bianco is the town of Siculiana, having about 4500 inhabitants. It is pleasantly situated, but in an unhealthy climate. The chief trade consists in the exportation of sulphur, of which there are some extensive mines in the neighbourhood. The city of Girgenti, a few miles farther east, stands on a hill at nearly 1200 feet above the level of the sea, and is so elevated that almost every house in it can be seen at once. It contains 15,000 inhabitants, amongst whom is an abundance of monks and priests. It has a cathedral, a large and heavy structure of the thirteenth century; but it is irregularly built, dirty, and in appearance very poor. Near to it is the site of the ancient city of Agrigentum, said to have once contained 200,000 inhabitants, and to have been renowned for its power and commercial enterprise. The space which was once occupied by that city is now a continued range of orchards and gardens, and of groves of almond and olive trees. The vestiges of the city have been amply described by Captain Smyth, in his able and accurate account of the island. The port is formed by a mole, having on it a light-house; and without it there is good anchorage. At this port, also, large quantities of sulphur are shipped.

About five miles from Point Bianco is the respectable city of Palma, at the distance of two miles from the shore. It contains about 8000 persons, who enjoy comparative affluence, derived from a brisk trade in almonds and sulphur. The town overlooks one of the richest and best cultivated valleys in Sicily, and near to it many cattle are reared. In the bay of Grugno, about ten miles from Palma, is the city of Alicata. It stands at the mouth of the river Salso, otherwise called Ciotta, one of the largest streams of Sicily. The ground near the shore is shoal and rocky, yet in the summer it is a place of some trade, exporting corn and sulphur. It contains about 11,000 inhabitants. The provinces of Mazzara and Noto are here divided by the river Salso. At the entrance there is a bar, on which the surf beats so heavily with southerly winds, that boats can only enter it by a narrow passage, which is always difficult, and sometimes dangerous.

At the distance of fourteen miles from Alicata, along an open beach, is the city of Terra Nova, the *Gela* of antiquity. About a mile from the town there is good anchorage in from seven to ten fathoms water, but it is much exposed when the wind blows from the south-west. The city is situated on table-land, considerably elevated; and it has a fine palace, but few other edifices worthy of notice. The country around abounds in corn. Terra Nova contains about 9000 inhabitants, who chiefly subsist by trading in sulphur, corn, wine, and by making some coarse cloth.

The whole coast to Cape Scalambra is within a reef of rocks, always an object of peculiar dread to the ancients, and, notwithstanding all the improvements made in navigation, the cause of the loss of many ships. It is not safe to approach nearer the shore than a depth of water of fourteen fathoms, nor, with a westerly wind, quite so near as that depth. The eastern side of Cape Scalambra has a small port for vessels of an easy draught of water, where carruba beans, charcoal, wood, and some other articles, are shipped. From Cape Scalambra the distance to Point Spina is eight miles; at the latter place the coast is foul and rocky; but at three leagues farther is the town of Pozzallo, which is the chief shipping place for the produce

Naples. of the district. The next point is Cape Passaro, which terminates the southern side of the island. It is the most southern land of Sicily, being in east longitude 15. 8. 56. and in north latitude 36. 41. 30. Near to it the water of the limpid stream of Busaidone irrigates the land of Spaccaforno, a walled town three miles from the shore. It has 8000 inhabitants, with numerous churches, convents, and public buildings. The trade is chiefly with Malta, to which it exports grain, flax, carrubas, acorns, soda, and live cattle.

The western shore of Sicily, which extends from Cape St Vito to Cape Granitola, will require but a short description. Proceeding from the first of those capes in a southern course, we come to Point Emilia, opposite to which is the dangerous shoal of that name, on which there is only two fathoms of water, whilst everywhere around it there are from six to ten fathoms. On Mount St Julian, at an elevation of 2175 feet, once stood the famous temple of Venus Erycina, one of the most magnificent and most sensual of all the heathen establishments, only a few vestiges of which now remain. The town of that name near it contains about 8000 inhabitants. At the distance of four miles from this is the city of Trapani, which may be approached with safety by vessels of from 200 to 300 tons; though, as the ground is much broken, and there are many countercurrents, great care is required on the part of the pilot.

Trapani is a fortified city occupying the site of the ancient *Drepanum*, is surrounded by a wall with bastions and ravelins, and contains about 25,000 inhabitants, amongst whom are some of the best artists, artificers, and sailors of the island. It is a place of much enterprise and industry. The streets are regular and commodious; the cathedral and senatorial palace are fine edifices; and there are many convents, two hospitals, and forty churches. From Trapani southward to Cape Boëo and Marsala, a distance of ten miles, the coast is altogether low, irregular, and varied by numerous islets resting upon a base of shoal and rocky ground, which in some parts extends two miles from the shore. The country on the main island is laid out in extensive salt-works, by the construction of causeways about a foot and a half high, enclosing square places which communicate by dams with each other. The salt is heaped in a pyramidical form, at a distance resembling tents, and when quite dry is exported, chiefly to Marseilles. The space beyond, anciently known as the Field of Hercules, produces abundance of sweet wine, as well as of corn, oil, and barilla.

Above Cape Boëo, in a healthy situation, stands the city of Marsala, the ancient *Lilybæum*, once the capital of the Carthaginians in Sicily. This place is moderately well built, and surrounded by a wall; the inhabitants at present amount to about 21,000, and produce much wine, fruit, and barilla. Near to it there is a great establishment for shipping the wine made at Marsala to England, where it is well known by the name of this city. The ground on the beach is all shoal and foul, and large ships must anchor at nearly two miles from the mole, which has been constructed near the English wine stores.

About nine miles from Cape Boëo is Point Feto, one league from which is the city of Mazzara, the ancient *Mazum*. It contains 8000 inhabitants, and, though so small, has a respectable appearance from the sea, the domes rising above the houses. It is surrounded with a Saracenic wall; but the streets are narrow, ill paved, and dirty. It is, however, a place of some considerable trade, exporting largely grain, pulse, cotton, wine, fish, fruit, barilla, madder roots, oil, and soap. The entrance of the river Salemi forms the little haven of Mazzara, and is convenient for small craft; but larger vessels are obliged to lie at a very exposed anchorage without, in from eight to twelve fathoms water, where the holding ground is a stiff clay. This place is about six miles distant from Cape Granitola, where terminates the survey that has been taken of the shores of Sicily. Connected with the survey there is an atmospheric phenomenon which deserves notice. It occurs principally on the southern coast of Sicily, but exhibits its greatest force in the neighbourhood of Mazzara. It commonly bears the name of *marobia*, and is thus described by Captain Smyth. Naples.

"Its approach is announced by a stillness in the atmosphere and a lurid sky, when suddenly the water rises nearly two feet above its natural level, and rushes into the creeks with amazing rapidity, but in a few minutes recedes again with equal velocity, disturbing the mud, tearing up the sea-weed, and occasioning a noisome effluvia. During its continuance the fish float quite helpless on the turbid surface, and are easily taken. The rapid changes generally continue from thirty minutes to two hours, and are succeeded by a breeze from the southward, which quickly increases to heavy gusts."

From the vast extent of sea coast appertaining to the two divisions of the kingdom of Naples, the fishery has been at all times one of the chief sources of occupation to the inhabitants, and, next to agriculture, employs the greatest proportion of labour. The principal branch of the fishery is that for the tunny, or *scomber-thynnus*, which is carried on by a kind of joint-stock company, in which the population of many towns and villages are engaged. This fish was, according to Oppian, in the highest estimation with the Greeks, the Carthaginians, and the Romans, who made from it the sauce called *garum*. This fish is gregarious, and shoals of them enter the Mediterranean early in the year, with an extended base for the tides to act upon, as they swim broad and deep, in a conical form. In the progress of the shoal to the eastward it inclines over towards the European coasts, and is caught in great abundance in May, June, and July. The average length of the tunny is from four to eight feet, and the girth is nearly the same; yet there are many of still greater size, and the females are always the largest.

The manner of taking them is similar to that which was practised by the ancients. Large nets are spread out in the shape of a parallelogram, about fifteen hundred feet in length, three hundred in width, and from forty to a hundred in depth, divided into four quadrilateral spaces called rooms, having channels of communication with each other. These nets are moved east and west at about a mile distant from the shore, across the known route of the fish, with each of the spaces at right angles, and secured vertically by a number of anchors and stones at the bottom, whilst the upper edge of the net is floated by large logs of the cork tree and other light wood. The whole is then connected with the shore by a stout single net of very large meshes, called the wall, that arrests the progress of the tunny, and induces them to enter the outer room, which is thereupon raised a little and closed by the boatmen on the look-out. The fish, alarmed, and seeking to escape, swim from side to side, and thus enter the next room, when their retreat is again prevented, and thus finally they enter the fatal part, called *corpo*, or chamber of death, where the meshes are smaller and stronger, and made of rope of superior quality to the rest of the net. When in this way the chamber is filled, which sometimes occupies two or three days, large flat-floored boats, peculiarly constructed for the purpose, assisted by many smaller ones, close round, and, weighing the net, secure the prey with harpoons, and another species of sharp hook on a wooden staff, that is struck into the head to prevent the fish from floundering. In the management of this weapon the fishermen display great dexterity. Although the size and shape of this fish have rather a disgustingly coarse appearance, the flesh is agreeable to the taste, and it is esteemed very nutritious food. There are often many other fishes taken with the tunnies, all

Naples. of which, except the sword-fish and the palamita, belong to the labourers as a perquisite beyond their wages.

The sword-fish passes by the shores of Sicily, in its route to the Archipelago and the Black Sea, about the time of the vernal equinox, and is often taken in the tunny nets; but in the Straits of Messina there is a particular fishery for them, in which much activity is displayed. This fish is taken by the harpoon, in a manner similar to that practised in the whale-fishery. When the fish is struck it immediately dives, and the long coil of rope fastened to the harpoon is suffered to run out till the animal becomes faint; but it is sometimes so vigorous as to oblige the fishermen to cut it adrift, lest it should draw the boat under water. The length of this fish is from seven to thirteen feet, exclusive of a sword projecting from the snout, about three feet long and three or four inches broad. The weight varies from eighty pounds to upwards of two hundred and fifty pounds. Notwithstanding this magnitude, the flesh is esteemed very delicate food, and, when broiled in slices, resembles veal.

The anchovy fishery is chiefly carried on for the sake of foreign trade. That fish is taken in shallow water during the months of March, April, and May, by means of nets ten or twelve feet wide, and very long. The curing of them occupies about a month. The fish are first thrown into brine, to give the salters time to nip off their heads with the finger and thumb, and pack them regularly, with alternate layers of salt, in the barrels designed for their exportation, which generally contain about two hundred pounds each. When the cask is filled, a round board, somewhat smaller than the head-piece, is placed over the whole, and loaded with stones, by which the contents are sufficiently compressed in a few days to allow of the casks being properly coopered up for exportation.

Besides these large objects of the fishery, the coast swarms with mullets, the roes of which are converted into a sauce called *botarga*, which is in much request. A great variety of testaceous and crustaceous fish, amongst which are prawns of gigantic size, is taken along the whole shore. Coral is also fished for in many places, but yields the greatest profit to the seamen and merchants of Trapani, on the western coast of the island.

The importance of the fishery in a country where the number of days in which the inhabitants are precluded from animal food is so great as in Italy, has induced us to give a more extended notice of that subject, and the shores on which it is conducted, than would have been appropriate under other circumstances.

We turn now to that branch of industry, the cultivation of the soil, which in every country is the chief occupation of the people, and at the same time the principal means of their subsistence. In this work, under the head of Lombardy, the agriculture of that country is minutely described; and the observations there communicated are in a great degree applicable to the kingdom of Naples. The difference of climate in countries removed from each other by six to eight degrees of latitude, will necessarily cause some difference in their productions and in the modes of obtaining them.

Both on the continent and in the island of Sicily much silk is procured, but very little beyond what is required for domestic consumption. But the same diligence and skill is not applied as in Lombardy and Piedmont to the increase of mulberry-trees. Oil is the chief article of the agricultural kind which is exported. The olive-trees are abundant in all the provinces, with the exception of the Abbruzzi, Molise, and Basilicata, and the mountainous parts of Calabria. In the provinces of Bari and of Otranto nearly two thirds of the land are covered with olive-trees; but in these places the quantity is more thought of than the quality, and the oil will scarcely keep more than one year. It is the substitute for the butter made in the more northern parts of Italy, and enters largely into all the edible preparations of the inhabitants. A large portion of the oil is converted into soap, and it is generally used in lamps to supply the place of candles. The quantity of oil exported has of late years been, on an average, 36,300 tons, valued at L.762,900; that exported to Great Britain is estimated at 4500 tons, valued at L.90,000. Naples.

There is much wine grown, but of bad quality, and not capable of being kept more than the year in which it is made; but some of tolerable quality and flavour, and of durable strength, is made in Sicily, and finds a good vent in England, to which market about 300,000 gallons are annually exported. Cotton-wool is grown in the provinces of Bari, Otranto, and Basilicata, on the continent, and upon a small scale in several parts of Sicily. The annual growth is about 80,000 bags; but this quantity is insufficient for the home consumption, and a supply of cotton yarn and of cotton goods from England is required to the yearly amount of about L.375,000. Flax and hemp are grown, as likewise tobacco, saffron, liquorice, almonds, figs, raisins, currants, dates, oranges, lemons, capers, manna, and a variety of other precious fruits. In most years this kingdom grows rather more corn than is required for its own consumption. This consists chiefly of maize, upon which the poorer classes principally subsist. Wheat, when sown, is generally a beneficial crop, though occasionally subject to blight, and to other accidents of the weather. In some of the marshy portions of the country rice is cultivated with success, in spite of its ill effects on the health of the inhabitants. In the best cultivated districts, the pasture-land is inconsiderable, and the stall-feeding of cattle is generally practised. There are, however, in the mountains, some extensive plains, affording excellent pasture for sheep. The whole number of sheep in the kingdom is estimated at 2,500,000, about one half of which are migratory, being kept on the mountains in summer, and in the valleys in winter. The wool varies in quality, but is in general good, and some portion of it is exported. The cows are of a race brought from Hungary. The oxen are commonly used to plough the land, and to draw waggons or carts. In the warm and marshy parts of Terra di Lavoro and Puglia are reared some buffaloes, which serve as beasts of draft, and whose milk is converted into a kind of cheese called *provole*. Horses are said to degenerate fast in Naples. Numerous mules are reared, especially in the provinces of Otranto and Abbruzzo, whence those appropriated to the use of the nobility in their carriages are mostly brought.

The condition of society, and the tenures of land, contribute much to the depression of agriculture, and, through it, of every other description of industry. The soil is owned in very large portions, either by the king, by the religious houses, or by the higher nobility. The peasants who cultivate the land are commonly *metayers*, dividing equally with the lord the annual produce; but in many cases where the soil is peculiarly fertile, the peasant has but one third of the harvest for his share. Under the government of the Napoleon family, some of the church-lands were sold to speculators; but the change of proprietors has caused no alteration in the condition of the occupiers, or in the course of husbandry. As the climate of Sicily is somewhat warmer than that of the continental part of the kingdom, there is some variation in the practice of husbandry, as well as in its productions. The wheat of Sicily, which in ancient times contributed greatly to the subsistence of Rome, is not now extensively cultivated, because the peasants find it much more profitable to grow hemp and flax. A very large portion of the cultivated land is under fallow, which, from the scarcity of manure, is adopted, and forms an imperfect substitute, for that material. With the negligent culture of Sicily, the corn exported, chiefly wheat,

Naples. is nearly equal in value to that of all the other commodities which are exported. Some of the feudal rights of the nobles have been abolished, and, instead of the personal services of the peasants, the system of a partnership in the products, as described in the continental division, has been introduced.

The mineral productions are insignificant, and consist solely of some iron extracted from mines in the vicinity of Stilo. There are mines of rock-salt, which are but slightly worked. That substance, however, is largely collected on the sea-shore, where, by the operation of the sun alone, it is prepared for culinary purposes. In Sicily much sulphur is obtained, and forms an important article of foreign trade. Some alum is also collected; and in many parts quarries of marble, of various descriptions, are extensively worked; but most of that substance is used for the building in and around the cities of the kingdom.

The manufactures of this kingdom are for the most part of the domestic kind. The females spin the flax, hemp, or wool, and the coarse cloths made from those substances satisfy the majority of the inhabitants. Silk goods are made in some establishments of greater magnitude than those adapted for the manufacture of other articles. There are manufactures of coarse woollen goods in many of the provincial cities, and also of cotton goods. Leather, paper, hardware, glass, earthenware, and porcelain, mostly of indifferent workmanship, and in small portions, are also made in several parts of the kingdom. The condition of the great body of the people compels them to be satisfied with coarse clothing, little or no domestic furniture, or even cooking utensils, and to procure what little they do use of the cheapest and most durable kind.

No country of Europe has so little foreign trade, in proportion to its extent and population, as the kingdom of Naples. It produces almost every thing that is necessary for the inhabitants, and has a very magnificent surplus of productions to give in exchange for the few luxuries which the condition of the population requires. The chief part of the foreign trade centres in the city of Naples, to which the greater portion of the spare products are brought by small coasting vessels, and whence also are dispensed what foreign commodities are required. The nature and extent of the trade, as far as these can be obtained, will be found in the account of that city.

The face of the country displays great inequalities. The Apennines enter the kingdom on the north-west side, from the papal territory, and at Rappolla divide into two branches. The left branch runs through Basilicata to the province of Otranto, where they terminate in the sea at Capo di Leuca; though it is asserted that a continuation of them under the sea extends to the island of Corfu and the Turkish dominions. The right branch runs through the three provinces of Calabria to the southernmost part of the peninsula, near the Straits of Messina. The highest point of this range of mountains within the kingdom is Tassa d'Italia, 8255 feet in height, near to which are some others of about equal height, but which have not been accurately measured. The next loftiest are, Monte Calvo, 4810 feet; Monte Celevo, 4800; Sila, 4634; Vesuvius, 3500; Bolgario de Salerno, 3496; and Epomeo d'Ischia, 2364 feet. From each of these chains of hills there are many spurs, some insulated, and others connected with the main branch. Those on the western side have at some period had volcanoes of greater or less igneous production, the existence of which is manifest by the lava and tufa which their eruptions have left, though none but Vesuvius is now in activity. These minor branches of mountains, projecting from the main range, are so far distant from each other as to leave spaces for plains of various extent, which open on both sides towards the sea. Upon the eastern side some of these are extensive steppes, and the mountains looking in that direction are in a great degree naked and barren; but the smaller hills, and the valleys between them, are for the most part pleasing to the view, and highly fertile. On the western side of the main range, especially near the coast, there seems to exist a subterraneous fire, which finds vent in Vesuvius, and in other parts, as is manifest by the tremendous visitations of earthquakes. Naples.

The kingdom of Naples, taken as a whole, is scantily supplied with water, though in some parts there is so much that it renders the air unwholesome. As the mountains run through the middle of the country, and the rivers have their sources in them, their courses are necessarily short. The eastern side of the Apennines is by far the driest, and the rivers are of the shortest course, whilst many of them are nearly or altogether destitute of water in the summer months. The chief rivers are, the Garigliano, which enters it from the papal states, and runs to the sea in the province of Terra di Lavoro; the Volturno, which receives the smaller streams Cavaliene, Lorda, Tarano, and Salone, and enters the sea near the town of Mondragone, on the western coast; the Crati, which rises in Calabria Citeriore, waters the plains of Cosenza, and enters the gulf of Tarento near St Mauro; the Silaro, which rises at the foot of the mountain Paflagone, in Principato Citeriore, receives the waters of the Calore and the Negro, and falls into the sea at Altavilla; the Ofanto, next to the Garigliano the largest river in the kingdom, but in no part navigable, rises in Principato Citeriore, passes through Capitanata, and empties itself into the Adriatic Sea; and the Pescara, which is composed of two mountain streams of Abbruzzo, runs to the north, and falls into the Adriatic. The shorter streams are numerous, and mostly destitute of water in the hot months. There are no canals available for the purposes of navigation, but many of short length have been constructed in order to irrigate particular districts. There are several internal lakes, but only one of considerable extent. The lake of Cellano, sometimes called Fucino, in the province of Abbruzzo, is fifteen miles in length and ten in breadth, and receives the waters of three small rivers. It has a river issuing from it, but frequently overflows the surrounding country, and generates pestilential malaria. Amongst the smaller lakes, that of Agnano, in the province of Naples, between the mountains Astroni and Pausilippo, has the singularity of being without any streams either entering or issuing from it, but is kept in motion resembling the rise and fall of tides in the sea by subterraneous gases, which are constantly escaping from it, and have a pestiferous effect upon those who approach too near to it. Some baths in the vicinity are found beneficial in cases of siphilis, gout, and rheumatism. The smaller lakes are very numerous.

The climate is healthy, excepting in the spots where stagnant water produces malaria, and at the time when the easterly wind, called the sirocco, prevails. The heat of the sun is tempered by the breezes from the sea, which surrounds the kingdom on three of its sides. The quantity of rain which falls annually is about twenty-nine inches, or one third more than falls in Paris. Snow is rarely seen, except upon the high mountains, and the rivers are never frozen.

The government of this kingdom is an unmixed and absolute monarchy; but in the Sicilian division there is a sort of mixed constitution, and a body with the name of a parliament. The power of the parliament is, however, of so little weight as scarcely to deserve notice. The only check on absolute power is the rigid adherence which the great mass of the people evince to their ancient customs, and to their civil, judicial, and religious practices. After the disturbances of 1821, a body of the most respectable inhabitants was formed by the king, one on the continent and an-

Naples.

other in Sicily, under the name of *Consultas*, who were represented to the people at large as securities for the good government of the two portions of the dominion, and were to exercise supervision rather than control over the several branches of the executive administration. Like all such half or evasive measures, no good effect has been produced by them, nor have they any legislative influence.

The religion of the whole kingdom is strictly that of the Roman Catholic church, which all the inhabitants profess, except about 80,000 Greeks, who follow the ritual of their church, and about 2000 Jews, who are tolerated. The church establishment comprehends fourteen archbishops, seventy-seven bishops, 129 assistant bishops, 26,800 priests, 11,730 other clerical persons in rank below the priesthood, and 9520 female religious persons. Education is at a low ebb. In Naples there is a university with 1350 students, another in Palermo with 400, and a third in Catania with 300. There are also many Latin schools for citizens, and a few primary schools.

The revenues of the kingdom arise chiefly from taxation of various kinds. Nearly one third is derived from a land-tax; the remainder is collected from an excise on consumption, from a stamp-tax, a lottery, from the post-office, and from a deduction of ten per cent. on all the salaries of public officers. By the accounts of 1831, the amount of the whole was 26,650,000 ducats, or, taking the ducat at 4s. 3d. sterling, about L.5,360,000. The expenditure of the government in the same year amounted to 27,340,000 ducats. By the growing increase of the taxes, the revenue amounted, in the year 1834, to 30,900,000 ducats, thus leaving a surplus applicable to the sinking fund for diminishing the national debt. The debt consisted of two portions, viz. somewhat more than one million sterling within the kingdom, and a loan made by the Rothschilds in England, amounting to two millions and a half. By the increase of revenue these debts are in course of liquidation, and it is estimated that, if no interruption of the present progress should intervene, in the year 1842 the whole debt will be discharged. The income and the expenditure of Sicily are stated to be nearly one third part of that of the united kingdom. The expenditure of the royal family is about L.420,000 a year, and that of the army L.1,700,000.

The army consists of the royal guards, which comprehends a corps of horse artillery, two of grenadiers, one of jagers, and two of cavalry; and the troops of the line, which comprehend a corps of engineers, two regiments of artillery, a brigade of veteran artillery, a brigade of artificers and miners, eleven regiments of infantry, of which four are Swiss, and three regiments of cavalry; the whole amounting to about 30,000 men.

The cities in the two divisions of the kingdom, which contain a population of more than 11,000 persons, are the following:

Naples	358,994	Aci Reale	14,994
Palermo	173,015	Girgenti	14,882
Messina	70,111	Gaeta	14,812
Catania	55,400	Castel Vetrano	14,782
Trapani	24,330	Termini	14,150
Foggia	20,687	Taranto	14,111
Marsala	20,559	Lecca	14,081
Modica	19,702	Randazzo	14,000
Bari	18,937	Siracusa	13,851
Barletta	17,695	Aversa	13,826
San Severino	16,640	Trani	13,787
Ragusa	16,616	Mascol	13,705
Canicatti	16,455	Bitonto	13,700
Caltanisetta	15,627	Avellino	13,467
Monopoli	15,536	Alcamo	13,000
Castello à Mare	15,001	Monreale	12,776
Chieti	12,666	Monte St Angiolo	11,500
Lanciano	12,576	Molfetta	11,496
Corleoni	12,527	Catanzaro	11,464
Lipari	12,483	Licata	11,250
Salemi	12,258	Matera	11,158
Nicosia	12,064	Castro Reale	11,146
Sarno	11,933	Castro Giovanni	11,143
Piazza	11,904	Francavilla	11,108
Ariano	11,718	Noto	11,058
Sciacca	11,514	Partanna	11,006

Naples.

NAPLES, a city of Italy, the capital of the kingdom of the same name, though frequently called the kingdom of the Two Sicilies. The exact position, as taken from the light-house, is 14. 15. 45. east longitude from Greenwich, and 40. 50. 10. north latitude. This city stands on the shore of a bay or gulf of the same name, the beauty of which has been so long and so generally celebrated, that it requires only a short notice here. This bay, taken as a whole, may be considered as one of the most interesting, as well as most beautiful, on the globe. The curiosities both of nature and of art; the remains of classical antiquity; the varied and wonderful scenery; the volcanic eruptions and earthquakes which it has experienced; the cities founded and established in all the pride of luxury, but since overwhelmed; mountains converted into lakes, and lakes turned into mountains; all of these form a combination of circumstances and events, which is to be found in no other spot within the same compass on the earth's surface.

After the lapse of many centuries, the vestiges of the terrible subterranean fires that convulsed these coasts are still visible. The lakes Acheron (*Mare Morto*), Avernus (*Averno*), and others which border the sea, are incontestibly the craters of ancient volcanoes, as well as the enormous cones reversed, which are everywhere seen on the shores, on the summits of the mountains, on their sides, and at their bases. The remembrance of the most ancient convulsions was conveyed by tradition, and, being embellished by the poetical imaginations of the Greeks, whose colonies were established on these shores, gave birth to the mythology concerning the infernal gods. The yawning fissures, several of which showed the existence of internal fires by the smoke that issued from them, whilst others emitted pestilential vapours, were easily conceived to be the gates of Tartarus, and the entrances to the realms of death. Temples were erected on their edges, at which the worshippers arrived by subterranean passages; and hence are derived the fables of the Sybils, and the poetical descents to the infernal regions. Nature having reposed for ages, the fertility of these districts was renewed, and men, invited by that fertility, as well as by the serenity of the climate, crowded to their shores. The city of Cumæ was founded probably by a colony of Greeks; and others succeeded, which formed many petty sovereignties, sometimes at war with each other, sometimes allied, until all were finally absorbed in the Roman empire.

The Romans, masters of the known world, and enriched by the spoils of the East, thought only of enjoyment. Tired of the monotonous splendours of their capital, they sought in the country the charms of tranquillity mingled with luxury. But no part of Italy offered such natural advantages as the shores of the Bay of Naples, which, being blessed with a genial climate and a serene sky, and possessing abundance of warm springs for the formation of baths, were gradually covered with villas and temples by the now effeminate Romans. Thus, the whole country from Cape Miseno to Sorrentum, seemed to the eye but one continued city. Within this extent were built the towns of Misenum, Baia, Direachea or Puteolis (*Pozzuoli*), Neapolis (*Naples*), Herculanum, Pompeii, Stabia, and Sorrentum, each of which had its theatre, amphitheatre, forum, and

Naples. an incredible number of temples, the ruins of which attest their former magnificence.

Amidst these circumstances of pomp and luxury, frequent earthquakes at length alarmed the voluptuous inhabitants, and were the precursors of a dreadful crisis. Vesuvius at that time presented the aspect of an ancient volcano, but nothing indicated that its fires were not entirely extinct; its sides were highly cultivated in their whole circumference, and its summit alone appeared arid and burned. In the first year of the reign of Titus (A. D. 79), its fires burst forth suddenly; rivers of fluid lava and mud issued from it, as well as clouds of ashes and pumice-stone, which overwhelmed all the eastern shores of the bay; and, from Herculanum to Stabia a chain of hill composed of those substances occupied the place of fertile fields. These two towns, as well as Pompeii, disappeared, whilst the western shore suffered nothing, the lava stopping at Naples, which itself received but little damage.

The nobles of Rome, however, continued to pass part of the year on the shores of Naples, and the period when they were generally deserted is unknown; but it is supposed to have been during the ages of barbarism which succeeded the fall of the Roman empire. The appearance of the shores, and the ruins which cover them, from Cape Miseno to Pausilippo, attest the ravages of one or more convulsions posterior to that which occurred in the reign of Titus. The mountains have been torn into fragments, the passages to the subterranean temples filled up, and the temples themselves either destroyed or displaced; whilst the sea must have rushed with rapidity over the lands from which it is now again slowly retiring. The only convulsion of which the date has been preserved is that of 1538, in which the Lucrine Lake, so famous for its oysters, was greatly reduced, and a mountain rose in its place.

The bay, the history of which has been here sketched, is distinguished at its entrance by the islands of Ischia and Procida to the north-west, and by the island of Capri and the promontory of Campanella to the south-east. The breadth of the entrance is about five leagues; and there, as well as within the bay, is good anchorage, with a depth of nearly seven fathoms water. The bay is well sheltered from all winds, excepting those which blow from any point between east-south-east and due south; and it is exposed to the sea only by the passage between Capri and the main, which is of little or no consequence. In the bottom of the bay a harbour has been formed by the construction of a mole in the shape of the letter L, in which merchant ships and most of the royal navy lie, and where boats may always land. There is no regular tide, but a rise and fall of waters is occasioned by the winds in south-west gales. Ships can be conveniently supplied with water at the mole. The extent of the bay is about thirty miles, and the city is built at the bottom of it, and extends along the shore in the same circular shape as its form. It rises from the shore like an amphitheatre, and, as a whole, can be most advantageously seen from the water. The entire line of buildings, including the suburbs, is between four and five miles. Towards the sea, the sameness of the range of buildings is relieved by many beautiful quays, and the great number of vessels and boats approaching to or proceeding from them, and by two forts which defend the town, called L'Uovo and San Elmo.

This city may, in regard to extent and population, be considered as the fourth in Europe, following after London, Paris, and Constantinople, unless the late rapid increase of Moscow shall cause it to rank after that reconstructed metropolis. The streets of the city are mostly in a circular direction, and many of them are narrow. They are well paved with lava, and of late years have been lighted by lamps hung in the French manner in the middle of the streets. They are generally kept clean, the filth being carried away by large subterranean sewers. From their narrowness, and the height of the houses, they have for the most part a gloomy aspect. The Strada di Toledo is however an exception, and is one of the finest streets in Europe. It extends half the length of the city, is bordered on both sides by magnificent houses, and is terminated at one extremity by a square, the Piazzo di Mercato, and at the other by the royal palace. The houses in it are of singular architecture, and more remarkable for their size than their elegance. They are mostly six or seven stories in height, have flat roofs, and are covered with a kind of stucco made of pozzolano sand, which becomes indurated by exposure to the atmosphere. Most of them have balconies in front; and the roofs are frequently covered with flowers, shrubs, and small trees, planted in boxes filled with earth. The attention of visitors is much attracted by the Largo del Palazzo, by Santa Lucia, and the Platamone, but more than all by the Chiaja, which comprehends a public garden called the Villa Reale, extending more than half a mile in length on the margin of the bay, and reaching to the grotto of Posilipo. This garden is ornamented with luxuriant trees, shrubs, flowers, and modern statues, and has the basin of a fountain standing on the backs of four lions; a group found at Pæstum, and placed here in the spot which was previously occupied by the celebrated Toro Farnese, now removed to the Museum. Naples.

In noticing the public institutions of Naples, the most prominent object is that now called the Studii Publici. This university was erected by the viceroy Fernando Ruez de Castro, according to the plan furnished by Fontana, and opened in 1616 by his son and successor Don Pedro de Castro. In the year 1790, King Ferdinand I. removed the university to the convent of Gesu Vecchio, and converted the edifice built by De Castro into a Royal Museum, which has been since enriched by the antiquities found in Minturnæ, the ancient Capua, Herculanum, Pompeii, Nucera, Nola, and Pæstum, together with the collection of paintings once placed in the palace of Capo di Monte; and thus this Museum may now be considered as the finest in Europe, more especially with respect to Grecian and Roman antiquities.

Although few objects of the kind are more worthy of detailed description, yet the nature of this work necessarily forbids any other than mere cursory notices of the most distinguished of them. In the quadrangle which the building forms there is a colossal statue of Alexander Severus, another of the Genius of Rome, and one of Urania, reported to have been found in Pompey's theatre at Rome. The staircase is ornamented with a lion in Carrara marble, and two statues in Greek marble, taken from Herculanum. Surrounding the quadrangle are the schools for drawing, and the apartments appropriated to antique fresco, statues, and other works of art. The division of this institution next to be noticed is the gallery of ancient paintings found in Herculanum, Pompeii, and Stabia, which have been recently removed from Portici. These are so elegant in regard to composition, and yet generally so badly executed, that it is supposed the greater part of them may have been copies made by common house painters from the most renowned pictures of antiquity. Recent excavations at Pompeii have, however, produced large historical pictures, far too well executed to have been the work of common painters, and so admirable with respect to accuracy of outline and beauty of composition, that even the *frescos* of Raffaelle in the Vatican do not excel them. The recently disentombed paintings are now added to those brought from Portici, and amount, including the latter, to nearly one thousand six hundred; a number which must increase almost daily, as long as the excavation of Pompeii is continued. This unique gallery has been so well arranged, that

Naples. there is every reason to suppose it may in future become the favourite study of modern painters. The subjects represented in these pictures are too numerous to be even named; and where so many are exquisite it would be difficult to make a selection for the purpose of describing them.

The gallery of ancient sculptures, or rather three galleries appropriated to them, contain numerous pieces of Grecian as well as of Roman workmanship, exhibiting busts of celebrated personages both male and female, especially of the family of the Balbi; several equestrian statues; groups of figures representing the actions of Bacchus, Cupid, Venus, Apollo, Cybele, Ganymede, and Euterpe. The greater part of these have been obtained by excavation from Herculanum or Pompeii.

The hall of Flora, the hall of Apollo, the hall of the Muses, the hall of the Venuses, the hall of Jupiter, the hall of Atlas, and that of Antinous, are filled with statues which have some connection with the names they severally bear. Many of these are from the Grecian chisel, some attributed to, or known to be the work of, Phidias and Praxiteles. In the hall of the Muses is the large beautiful vase of Greek marble, an inscription on which shows it to have been the work of an Athenian sculptor of the name of Salpion. It is adorned with bas-reliefs relative to the education of Bacchus. In the cabinet connected with these galleries there are some statues highly valued, especially one attributed to Praxiteles, called *Venus Callipige*, the rival of the Venus de' Medici. There are also many smaller figures and groups which never fail to excite admiration.

One apartment is appropriated to the celebrated group of the Toro Farnese, and bears that name. This piece was originally brought from Rhodes to Rome, but removed thence to Naples about the close of the seventeenth century. It is supposed to represent Dirce bound with the hair of her head to the horns of a bull by Amphion and Zethus, the sons of Lycus king of Thebes, and their mother, Antiopa, commanding them to detain the bull and set Dirce free. Antiquaries are of opinion that this group was formed from one solid block of marble, by two Rhodian artists, Apollonius and Tauriscus, about two hundred years before the Christian era. It was found cruelly mutilated in the baths of Caracalla, and restored by Giovanni Battista Bianchi of Milan. The head of the bull and the upper parts are modern. The trunks alone of the figures of Amphion and Zethus are antique; but the statues of Antiopa and the youth seated are nearly in their original state.

These galleries also contain columns of precious marbles, found in Herculanum, Pompeii, and other parts of Magna Græcia; and the statue of the priestess Eumachea, from Pompeii, has been lately placed near the open court also. There are the measures of capacity found at Pompeii, and a small perpetual almanac of marble, corn-mills of lava, and a machine of lava for bruising olives in order to extract oil, all of which have been brought from Pompeii.

An apartment on the ground floor is wholly filled with antiquities of the Etruscans, or those of the more ancient people the Osci, or some brought from Egypt. Amongst the first are many curious vases; and among the others, well-preserved mummies of the human species, in painted cases of sycamore wood. Another of the rooms is wholly filled with bronze sculpture of animals and human figures of various sizes, in different positions and actions. These have been mostly obtained from the excavations in Pompeii and Herculanum.

Above these rooms, on the large landing place, in an apartment on the left, are the papyri found about the year 1753, in a villa of Herculanum, unrolled. This library of papyri was discovered under what is now the garden of the Augustine monks in Portici; but as the scrolls of papyri found in Herculanum were so precisely like charcoal that they had been constantly taken for it, the scrolls in question might have shared the same fate, if the order in which they were placed, one above another, had not excited curiosity, and produced an examination, which led to the discovery of Greek and Latin words written on these supposed pieces of charcoal. The diligence of the excavators was in consequence redoubled; and seven inkstands, with a stylus case, all of ancient pottery, together with three small busts in bronze, one of them representing Epicurus, were found in the same room with the papyri, which, amounting to 1730 scrolls, were deposited, by order of Charles III. then king of Naples, in the Royal Museum at Portici, whence they were conveyed to the Museum at Naples; and notwithstanding they are so much scorched as to resemble tinder, the Padre Antonio Piaggio invented a machine capable of separating and unrolling them. Those hitherto unrolled are 408 in number, of which eighty-eight only are legible; the others being fragments, are very difficult to decipher. Two volumes of these papyri have been published, one in the year 1793, and the other in 1809; a third is, we understand, in preparation for the press. The first volume contains a work of Philodemus on music; the second contains a fragment of a Latin poem, supposed to have been written by Rabirius, and two books, the second and eleventh, of Epicurus upon Nature. The third volume will contain, amongst other matter, the tenth and eleventh books of Philodemus, the former on economy, and the latter on pride. It is conjectured, that of the manuscripts still remaining to be unrolled, twenty-four are Latin, and the remainder Greek. Naples.

The library, the door of which is on the landing-place, is a magnificent apartment, being 212 feet in length, eighty in width, and eighty-one in height. This library is stated to contain 300,000 printed volumes, and 6000 manuscripts. The collection of books printed in the fifteenth century is particularly valuable, because it comprises those published during that period at Naples, many of which are unknown to librarians in general. There is likewise a superb collection of works published by Bodoni; and amongst the manuscripts are the works of St Thomas Aquinas, the Aminta of Tasso, the Acts of the Apostles written in the tenth century, and many illuminated missals of uncommon beauty, which had been executed for the Farnese family.

Other and spacious apartments in this Museum are furnished with those treasures from Herculanum which show the domestic manners and lives of the Romans. One contains the personal ornaments, such as rings, necklaces, brooches, ear-rings, medals, gems, gold chains, gold nets, bracelets, mirrors, pins for fastening the hair, and many similar objects. One room is the repository for kitchen furniture of bronze, exhibiting kettles, saucepans, and other utensils. Another is the repository for steelyards, scales, weights, measures, lamps, and candelabras; whilst others are miscellaneous repositories for various descriptions of objects, some valuable for their antiquity, others for their beauty, and all interesting, as tending to illustrate the history and the manners of the ancients. A gallery of paintings, the Farnese collection, forms a part of the Museum. It contains many most admirable pictures, but is especially rich in portraits of distinguished personages, and in historical Scripture pieces.

As there is not a museum in any country which, in all respects, can be compared with this, and as it forms the chief object of curiosity in the city, we have thought it proper to give some account of its contents. It deserves to be mentioned, that access may be always had to it, from eight in the morning to two in the afternoon, on all but festival and gala days.

Naples. One of those public buildings in Naples which deserve notice is the Palazzo Reale, the town residence of the king. It was erected by the Count di Lemnos, on a plan designed by the eminent architect Fontana. It contains magnificent apartments, handsomely furnished, and enriched with fine pictures. The most distinguished pieces are, the Madonna of Monte Casino by Raffaelle; the Cardinal Virtues, copied from Raffaelle by Annibal Carracci; Orpheus, by Caravaggio, and Christ disputing with the Doctors, by the same master. There is one fine hall hung round with portraits of the several viceroys, by Massimo and Paolo Mattei; and a handsome chapel, with an altar of agate, lapis lazuli, and other precious marbles. The residence of Prince Leopold, which stands nearly opposite to the Palazzo Reale, contains the finest collection of pictures in Naples.

As in other purely Catholic cities, the churches are objects of particular attention. In Naples they are very numerous. The archiepiscopal church or cathedral is dedicated to St Januarius or San Gennaro, the patron saint of the city. It is a Gothic edifice, more magnificent than tasteful, having been built on the site of an ancient temple erected in the time of the Emperor Constantine, which was destroyed by an earthquake. The outside is incrusted with white marble, and ornamented with two columns of porphyry. The inside is not splendid, though supported by upwards of a hundred columns of Egyptian granite, or Grecian and other marbles, taken from the temples of Apollo and Neptune. The font, placed near the principal entrance, is an ancient vase of basalt, adorned with the attributes of the heathen god Bacchus. The high altar is composed of precious marbles, and ornamented with two antique candelabras of jasper. Under it is a subterranean chapel, supposed to be the remaining part of a temple of Apollo, in which are the relics of the patron San Gennaro.

Within the cathedral is the chapel called Il Tesoro, built in consequence of a vow made by the city of Naples during a plague in 1526. The entrance to this chapel is through a magnificent bronze door, adorned with fine columns of rare marble, and statues of St Peter and St Paul. The interior of the edifice is a rotunda, embellished with a cupola, painted by Lanfranco, and supported by forty-two Corinthian columns, between which are placed, on festival days, thirty-six silver busts of saints, and eighteen busts in bronze, all executed by the most eminent artists. Over the altar is a statue of San Gennaro in the act of blessing the people; and a silver tabernacle containing the head of that saint, and two small vessels filled with his blood, supposed to have been collected by a Neapolitan lady during his martyrdom. The ceremony of liquefying the blood of this saint takes place three times a year, namely, in May, September, and December, and is thought an interesting sight by many foreigners. If it liquefy quickly, the joy expressed by the Neapolitans is great; but if there be any unexpected delay, the tears, prayers, and cries, are excessive, as the non-performance of this miracle is supposed to announce some dreadful impending calamity.

Our limits do not admit of noticing all, or even the names, of the numerous other churches within this city. The paintings and statuary in many of them are the finest pieces of art, and executed by the best masters; and the buildings themselves display the best models of architecture. Of these religious edifices, the number of parochial churches is fifty-five, and the churches in the monasteries, nunneries, and hospitals, are 149, besides about 150 chapels, and numerous oratories.

There are numerous hospitals in the city, and various charitable institutions for relieving distress, some of them well endowed. Amongst the most remarkable, is an extensive and magnificent building called Albergo de' Poveri. It is an asylum for orphans, and for children whose parents cannot afford to give them the advantage of a good education. In it the boys are instructed in reading, writing, drawing, and engraving; and the girls in sewing, knitting, spinning, and weaving linen, and in other arts beneficial in their station. Naples.

Naples abounds in theatres. The Teatro Reale de San Carlo is the largest and most splendid opera-house in Italy. It was destroyed by fire in 1815, and nothing was left standing but the front and the party walls; but in eleven months afterwards it rose from its ashes, ornamented with even more than its original splendour. It contains six rows of boxes, has a parterre capable of containing 670 persons sitting, with 150 standing, a stage, the dimensions of which are vast, spacious corridors, excellent stairs, and an edifice adjoining, called the Ridotto, which comprises ball-rooms, eating rooms, and apartments for gambling, the last of which have been closed since the last revolutionary disturbances. The Teatro Reale del Fondo is another opera-house, smaller than San Carlo, but very elegant. The Teatro de' Fiorentini and the Teatro Nuovo are appropriated to buffas, operas, and plays. The Teatro San Fernando is larger than any other except that of San Carlo. The Teatro della Fenica and that of San Carleno are very small, but much frequented on account of Puncinello, who is the prominent actor, and great favourite of the populace. These two houses are opened twice in every twenty-four hours.

Amongst other gratifications, Naples is furnished with some beautiful promenades. The most frequented are the Villa Reale, the Chiaja, the Giardino, and the Botanico, all constructed by the French, as was the Strada Napoleon, a magnificent work, which extends from the city to Capo di Monte. The road begun by Murat, extending from Mergellina to Capo Coroglio, is a beautiful promenade, two miles in length, leading to Pozzuoli.

The excursions which may be made in the environs of the city are of the most inviting nature, and especially attractive to all persons familiar with the writings of the classical ages. We have space to do little more than mention the names of the most prominent objects. In an excursion to Baiæ may be seen the tomb of Virgil; the grotto of Pozzuoli, 2316 feet in length and twenty-two feet in height; the Lucrine Lake; the villa of Nero; the ruins of Cæsar's villa; the temples of Venus, of Mercury, and of Diana; an amphitheatre, ruined by an earthquake, capable of containing 45,000 persons; and the sepulchre of Agrippina.

An excursion to Cumæ may enable the traveller to visit Solfatara, the *Forum Vulcani* of the ancients, where alum, vitriol, and sal-ammonia are now made from the volcanic substances in the vicinity; the villa of Cicero; the Lake of Avernus, with the temple of Monte-Novo, supposed to have been dedicated to Pluto or Proserpine; the remains of the aqueduct called Arco Felice; and the ancient city of Cumæ itself, with the grotto of the Sibyls.

To the Lake d'Agnano is a common excursion. It leads to the crater of a volcano; to the vapour baths of San Germano; the grotto Del Cane, the memphitic air of which throws a dog into convulsions, extinguishes a lighted torch, and prevents a pistol from going off; the Pisciarelli, a rivulet of boiling water; and the Astroni, the romantic crater of an extinct volcano, now converted into a royal hunting park.

A visit to Caserta, and especially to the grand aqueduct five miles beyond it, is highly gratifying. This celebrated work of modern date collects the water from nine springs, and conveys them through lofty mountains, and under a bridge of stupendous height and beautiful construction, a distance of nearly twelve miles. The Palace of Caserta, the most splendid royal residence, is a prodigious pile, of a rectangular form, 746 feet in length, 576 feet in

Naplous. breadth, and 113 feet in height. Superb columns ornament the outside of this edifice, the principal court of which is 507 feet in length, and particularly magnificent, as is also the grand staircase. The vestibule of the chapel, and the chapel itself, excite admiration; and the latter contains a fine painting by Mengs. The theatre is decorated with twelve columns of basalt, taken from the temple of Jupiter Serapis. The royal apartments, though vast and beautifully proportioned, are so ill furnished as to be but little worthy of attention.

As the three greatest objects of curiosity, Vesuvius, Herculanum, and Pompeii, are fully described in this work, the reader is referred to them in their alphabetical order, where the space allotted to them is more appropriately occupied than it would have been in a description of the city of Naples.

The French, whilst masters of the city, erected a fine and commodious market, which is in communication with the Strada Toledo. It is in imitation of an ancient *Forum Venalium*, and the centre is ornamented with an allegorical figure of Abundance. It is well supplied with all kinds of provisions from the fertile fields in the vicinity. The prices of the chief articles of sustenance are moderate, as stated by the British consular returns, viz. bread and flour 2d. per pound, beef 4d., mutton 2½d., pork 3d., cheese 6d., butter 1s. 4d., coffee 1s. 2d., and sugar 7d. The supply of vegetables is of the greatest importance, and the rates of all of them are very low. The fishing supplies abundance of food, and gives occupation to a large portion of the male population; and, besides what is caught in the neighbouring water, a considerable part of the cod-fish cured in Newfoundland finds a vent in Naples, as well as in the other Catholic countries which border the Mediterranean.

The foreign trade of Naples, in which city that of the greater part of the kingdom is carried on, consists in the exportation of silk, oil, wool, linseed, liquorice, wine, and a few smaller articles. The imports consist, as far as regards Great Britain, principally of cotton wool, cotton twist, and cotton manufactures, which, in value, are four fifths of the whole. Cod-fish and pilchards amount to about one half of the remainder, and the rest is composed of colonial articles. There is at some seasons a considerable importation of corn, chiefly of wheat, from Odessa, Taganrock, and the other ports in the Black Sea and the Sea of Azof. This wheat, distinguished by its hardness, and reduced to flour by pounding instead of grinding, is found to be the best for making macaroni, vermicelli, and similar kinds of food, which form a much more common kind of sustenance with the Neapolitan people than bread. Naplous.

The climate of different parts of the city varies much with respect to its salubrity; and in some parts, especially in that called St Lucia, it is found to be dangerous, not merely for invalids, but for persons in health. This arises from the vicinity of the sea, the dampness of which, combined with that of a tufa under which the houses are built, is very prejudicial. On the other hand, in the district called the Largo del Castello, the air is very soft, warm, and congenial to those who are afflicted with weak lungs. Naples is abundantly supplied with water; but all of it is by no means good. Some of the fountains, such as the Largo del Castello, that of Fontana Medina, and that of Fontana di San Pietro, yield excellent and salubrious water; but most of the rest have a tendency to produce dysentery, or other putrid diseases, especially in strangers.

The population of the city amounted in 1833 to 358,990, and was estimated in 1836 at 372,000. Amongst these are more than 40,000 called Lazaroni; a poor class, with no habitations, but sleeping in the streets, and picking up a scanty subsistence by occasional slight and servile occupations. Those who are best acquainted with the Neapolitan character give a favourable report of their manners: their passions are easily excited to acts of violence, but, when treated with mildness and kindness, they can, without much difficulty, be prevented from committing any very grievous excesses. (G.)

NAPLOUS, the ancient Sechem, a populous and flourishing city of Palestine, and the chief city of the Samaritans. In the time of Vespasian it was called Neapolis, or the New City; and it is mentioned by Pliny and by Josephus under the name of Neapolis. It continued long afterwards to be known chiefly by its Greek name, which has now been changed to that of Nablous or Naplous. It is situated in a long valley, which, according to the accounts both of Dr Clarke and Mr Buckingham, is beautiful, being covered with woods of olives, corn-fields, reservoirs of water, gardens, aqueducts in different directions, and all the marks of industry, opulence, and abundance. It is situated between the two hills of Gerizim on the south, and Ebal on the north, and completely fills up the intermediate valley, so that there is no room for its extension in breadth. The town consists of two long streets running nearly east and west through the centre of the valley, and these intersected by smaller ones mostly crossing at right angles. The town contains six mosques, five baths, a Greek church, an excellent covered bazaar for fine goods, and an open one for provisions; besides numerous cotton cloth manufactories, and shops of every description. One of the mosques, built within the precincts of a ruined church of St Helena, presents on its eastern front, which is still perfect, a fine pointed arch, supported by Corinthian columns. The inhabitants are mostly employed in the manufacture of soap; but the other products supply a very widely extended neighbourhood, and are carried by caravans to Egypt and Damascus, and to the rest of the neighbouring countries. Several relics of antiquity are here exhibited. Amongst these may be mentioned the tombs of Joseph and of Joshua, which are, as usual, hewn in the solid rock, and are thus calculated to endure. There is little doubt amongst the learned as to the identity of these relics. About three miles on the road to Jerusalem is a spot called Jacob's Well, to which still greater reverence is attached by the inhabitants, as the place where our Saviour conversed with the woman of Samaria. The resident population of Naplous has been estimated at 10,000, though Mr Buckingham seems to think this estimate somewhat high. They are almost all Mahommedans, the few Greek Christians scarcely amounting to fifty. The town is governed by a mutezellim, or magistrate, subject to Damascus; and he has at present about 402 Arnaut soldiers. The dress of the men is partly Turkish and partly Arabic, more nearly approaching to the former than the latter. The faces of the women are covered with a coloured veil, as in the towns of Yemen; they also wear a scarf of a yellowish white, with a deep red border, which is thrown over the head and shoulders. No Jews are permanent residents in this place. It is twenty-four miles north of Jerusalem. Long. 35. 22. E. Lat. 32. 16. N.

NAPOLEON.

Napoleon. NAPOLEON BUONAPARTE or BONAPARTE was born at Ajaccio, in Corsica, on the 15th of August, in 1769. He was descended of a patrician family, which had been of some note in Italy during the middle ages; and one of his ancestors, the gonfaloniere Buonaparte of Saint Nicolas, had governed the republic of Florence about the middle of the thirteenth century. But to this fortuitous circumstance he himself attached no importance whatever. A captain who had rendered his country illustrious, and by his own merit re-established the throne of Charlemagne, had little need of ancestry. "I am the Rodolph of my race," said he; "my patent dates from Montenotte."

His father, Charles Buonaparte, was an advocate of considerable reputation; and his mother, Letitia Ramolini, a woman eminent alike for personal beauty and uncommon strength of character. When the Corsicans under Paoli rose in arms to assert their liberty against the pretensions of France, Charles Buonaparte espoused the popular side, and, through all the toils and dangers of his mountain campaigns, was attended by his lovely and high-spirited wife. Upon the termination of the war, the father of Napoleon meditated accompanying Paoli into exile; but his relations dissuaded him from taking this step; and being afterwards reconciled to the conquering party, he was protected and patronised by the Comte de Marbœuf, the French governor of Corsica. At the date above mentioned, the man of his age was born upon a temporary couch covered with tapestry, representing the heroes of the Iliad. He was the second child of his parents, Joseph, afterwards king of Spain, being the eldest born; but he had three younger brothers, Lucien, Louis, and Jerome, and three sisters, Eliza, Caroline, and Pauline, all of whom grew up, and several still survive. Five others appear to have died in infancy; and at the age of thirty Letitia became a widow by the death of her husband, who seems to have left his family but indifferently provided for.

Napoleon's career has been so extraordinary, that his admirers have sought for prognostics of his future greatness in the circumstances of his infancy and youth. But these persons have deceived themselves. In his early years he betrayed no marked singularity, and when his character began to be formed, its development was too profound and too essentially intellectual to attract the notice of ordinary observers. His education was such as was then usually given in all the military schools. At the age of ten years, he was admitted at that of Brienne, where he spent several years devoted to his studies, and afterwards removed to the military school of Paris, where he appears to have completed his education. That he laboured hard both at Brienne and at Paris, may be judged from the vast quantity of information which his strong memory ever placed at his disposal, and which, from the nature of his after life, must have been nearly, if not wholly, accumulated at this period. He succeeded in all that he undertook, because his will was resolute and his perseverance inflexible. His purpose was strong, and his character decided; circumstances which afterwards gave him an advantage over all the world. The will depends upon the temper and disposition of the individual; it is not in the power of each person to obtain the mastery over himself. This was singularly illustrated in the character of Napoleon. If at times an appearance of uncertainty may be discovered in his resolutions, this did not arise from any defect of will nor infirmity of purpose, but from the extraordinary force of his imagination, which, with the rapidity of lightning, presented to his mind every side or view of a subject. He applied himself to studies which might be useful to him, particularly to history and the mathematics, the former of which developes the genius, whilst the latter regulates its action. His intellectual faculties exerted themselves without any great effort on his part. He had a lively and prompt conception, a strong memory, and a cool and decided judgment. He thought more rapidly than others, and thus had always time for reflection. His mind was too active to find amusement in the ordinary diversions of youth, to which, however, he was not an absolute stranger. He commonly sought for something to interest him, and this disposition placed him in a species of solitude, where he communed only with his own thoughts; a state which afterwards became habitual to him in all the situations of his life. Napoleon.

His birth having destined him for service, Napoleon had just completed his sixteenth year, when, in August 1785, after being examined by Laplace, he obtained his first commission as lieutenant of artillery in the regiment of *La Fère*. Never did he receive any title with so much pleasure as this. He was delighted beyond measure with his promotion, and the highest pitch to which his ambition then aspired was, that he might one day wear a couple of *epaulettes à bouillons*. A general of artillery seemed to him the *ne plus ultra* of human grandeur. But if he was not yet ambitious of power, he was already desirous of fame, and had conceived the idea of making himself a name by writing the history of the war in Corsica. He communicated his intention to Paoli, at the same time requesting that that officer would furnish him with the necessary information; but an historian of eighteen did not probably inspire any great confidence, and Paoli took no notice of his proposal. His advancement, however, indemnified him for this little mortification. In the year 1789, he obtained a company of artillery; and the Revolution, which broke out immediately afterwards, seemed to open up a new and more enlarged sphere of action. This is not the place to enter into any formal exposition of the causes which ultimately produced that violent shock of interests, out of which resulted the Revolution, with its long train of crimes and innovations; still less is it our intention to trace the progress of that mighty movement from the date of its immediate commencement until the moment when the subject of this notice first appeared upon the scene. Such a task is compatible neither with the object of the present article nor with the limits to which it is necessarily restricted; nor have we yet arrived at the time when, even if the case were otherwise, it could be executed in a manner corresponding to the magnitude and the importance of the subject. It appears, however, that Napoleon, young as he was, formed a very accurate estimate of its general complexion, as well as of its true bearing and direction. Aware that revolutions almost always proceed from opinions or interests compressed, or from opinions allied with interests, he was equally convinced that, when demands founded on justice and reason remained unsatisfied; when the mass of the nation had arrayed itself against the privileged orders, and a collision had in consequence taken place; the commotion, however violent, would in time subside, leaving the field open to genius, valour, and fortune, when happily united in one individual. But in order ultimately to command events, he saw that it was in the first instance necessary to go along with them; to profit by circumstances up to a certain point; and to remain in observation until the time for action should at length arrive. Hence he declared for the Revolution, because he foresaw that with it all his hopes and prospects were identified. "Had I been a general,"

Napoleon. said he, in the evening of his life, "I might have adhered to the king; but being a subaltern, I joined the patriots."

Happening to be in Paris in the year 1792, he witnessed the scene of the 20th June, when the revolutionary mob stormed the Tuileries, and placed the lives of the king and his family in the greatest jeopardy. He followed the crowd into the garden before the palace, and when Louis XVI. appeared on a balcony with the red cap on his head, he could no longer suppress his contempt and indignation. "Poor driveller," said Napoleon; "how could he suffer this rabble to enter? If he had swept away five or six hundred of them with his cannon, the rest would soon have disappeared." He was also a witness of the events of the 10th of August, when the throne was overturned, a provisional council established, the king confined in the Temple, the republic proclaimed, and a national convention called to frame a charter. At this time he was without employment, and poor; wandering idly about Paris, living at the shops of restaurateurs, projecting a variety of schemes some of them wild enough, and in a great measure dependent upon the scanty resources of his class-fellow Bourrienne. But the circumstances of the times were such that he was not suffered to remain long inactive. Being offered the command of a battalion of national volunteers destined to join the expedition to Sardinia, he readily accepted it; and, upon the return of the expedition, he re-entered the artillery with the rank of superior officer, or commandant. Till the siege of Toulon, however, he led an insignificant life. But this operation proved, in some measure, decisive of his fortunes. He saw that, from the situation which he held, as second in command of the artillery, he might have some influence on the result of the siege; and the event justified his anticipations.

When, towards the close of August 1793, Toulon, the great port and arsenal of France on the Mediterranean, had, along with the fleet, been delivered into the hands of the allies, the situation of France was truly deplorable. Lyons had raised the standard of the Bourbons; civil war raged in Languedoc and Provence; the victorious Spanish army had passed the Pyrenees, and overrun Roussillon; and the Piedmontese army, having cleared the Alps, was at the gates of Chambery and Antibes. Terror, discord, and defection reigned within; whilst, on the frontiers, one reverse followed hard at the heels of another. But the allies were not sufficiently sensible of the importance of the acquisition which they had just made. If thirty thousand Sardinians, Neapolitans, Spaniards, and English, had united with the twelve thousand *fédérés* in Toulon, this army of forty thousand men and upwards might have advanced upon Lyons, connecting itself by the right with the Piedmontese, and by the left with the Spanish army, and by this movement might have decided the fate of the Revolution. But the allies did not understand the real importance of their position, nor appreciate the advantages which it afforded.

About six weeks were passed in assembling the force and means necessary for the siege. On the 15th of October, a council of war was assembled at Olioulles, where the conventional proconsul Gasparin presided; and on this occasion, there was read to the council a memoir on the conduct of the siege of Toulon, which had been drawn up by the celebrated engineer D'Arcon, and approved by the committee of fortifications. Napoleon opposed the adoption of this plan, and proposed one much more simple. It was probable, he thought, that the allies would not abandon twelve thousand men in Toulon if the besiegers occupied the two forts which commanded the roadstead at its extremities; on the contrary, as soon as the communication between the English fleet and the garrison should be seriously threatened, it might be calculated that they would either evacuate the place or be made prisoners. "Your object," said he, "is to make the English evacuate Toulon. Instead of attacking them in the town, which must involve a series of operations, and ruin the place, endeavour to establish batteries so as to sweep the harbour and roadstead. If you do this, the English ships must take their departure, and the English troops will certainly not remain behind them. He then pointed out a promontory nearly opposite the town, by establishing batteries on which the desired effect might be attained. "Gain La Grasse," said he, "and in two days Toulon will be yours." Had this suggestion been adopted in time, the result would have been as Napoleon prognosticated; but the English had leisure allowed them to construct Fort Mulgrave, and to render it so strong that it went by the name of Little Gibraltar. Nevertheless, Napoleon's system prevailed. Instead of attacking the body of the place, the principal effort was directed against Fort Mulgrave, the reduction of which would secure the command of the narrow passage between the port and the Mediterranean, thus rendering an immediate evacuation inevitable; and in a month the desired end was obtained. On the 18th of December the besiegers entered Toulon, but were able to save only the half of the squadron; the other half, the arsenal, and the dock-yards, having been consumed by the conflagration kindled by the English as they abandoned the place.[1] Napoleon.

The recovery of Toulon was a service of the very first importance to the revolutionary government. It suppressed the insurrectionary spirit in the south of France, restored the credit of the republican arms, and rendered disposable the force which had been employed in the siege. But the man to whose genius alone success was due did not immediately obtain the credit of this important achievement, the absurd vanity of the representatives of the people having led them to claim the merit of expelling the English. The truth, however, was too generally known to be effectually concealed. Napoleon was appointed general of brigade, and, in the beginning of 1794, sent to the army of Italy to command the artillery. The general-in-chief, Dumerbion, was old, and incapable; the head of his staff, though a man of information, wanted talents; and, between them, war was carried on without art or skill in the Maritime Alps. Napoleon proposed a plan for turning the famous position of Saorgio. His suggestion was adopted; Saorgio, with all its stores, surrendered, and the French obtained possession of the Maritime Alps. He then proposed another, which had for its object to unite the army of the Alps and that of Italy under the walls of Coni; an operation which would have secured Piedmont, and enabled the combined force, without any great effort, to establish itself on the Po. But it was found impossible to come to an arrangement with the staff of the army of the Alps, because it would have been necessary to fuse the two armies into one, under a single chief, and neither general was disposed to yield. Besides, such an operation could not be undertaken without the approbation of the committee of public safety, which affected to direct the war from Paris, as the aulic council did from Vienna. Napoleon, however, indemnified himself by carrying the army of Italy as far as Savona,

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[1] During the siege of Toulon, Napoleon, whilst constructing a battery under the enemy's fire, had occasion to prepare an order, and called for some one who could write with facility. A young serjeant stepped out, and, leaning on the breast-work, wrote as he dictated. The writing was just finished, when a shot struck the ground by the side of the volunteer secretary, scattering dust over him and every thing near him. "Good," said the serjeant, laughing; "we shall this time have no need of sand." The cool gaiety of the remark pleased Napoleon; he kept his eye on the man; and Junot—for it was he—rose in the sequel to the rank of a marshal of France, and was created Duke of Abrantes.

Napoleon. and to the gates of Ceva; by which means he disengaged Genoa, then threatened by the allies, and would have achieved more important results had not his progress been stopped by the approach of winter and the imperative orders of the committee. He was superseded on the 6th of August 1794, apparently in consequence of the labours of Aubry, who had reformed the organization of the army, in order to impart to it greater solidity.

Before the end of the year he went to Paris in order to solicit employment, but at first experienced a very cold reception, probably on account of his supposed connection with Robespierre, whose younger brother he was known to have lived with on terms of friendship. The re-action consequent on the downfall of that extraordinary personage was then at its height, and threatened France with evils not less terrible than those from which it had just escaped.[1] Every thing was in an unsettled state, and the monthly renewal of the committee of public safety served only to increase the confusion. After a time, however, Napoleon was placed amongst the generals of infantry appointed to serve in La Vendée; but he refused to act in a situation which he considered as altogether unsuitable to him, and resolved to remain at Paris, where he might be more usefully employed. This proved a fortunate determination, and soon led to service of a more congenial kind. Kellermann had just allowed himself to be beaten in the Apennines. The committee were anxious to repair the disaster, and with this view attached Napoleon to the board of military operations, with orders to prepare such instructions as might seem calculated to bring back victory to the national standards. This afforded him an opportunity of making his talents known, and probably contributed not a little to the future advancement of his fortunes. Soon afterwards, he was appointed to command a brigade of artillery in Holland, where for some time the war had languished; but before he could avail himself of this appointment, his services were required upon a nearer and more important field of action.

Since the conquest of Holland, the armies had remained half a year inactive behind the Rhine; but though military operations were suspended, the agitation of the interior increased, and the clamours of faction became much more violent than ever. The Jacobins, wishing to resume their hold of power, which the fall of Robespierre had wrenched from their grasp, raised the faubourgs against the Convention; famine excited their adherents, and Paris was threatened with conflagration and massacre. The majority of the inhabitants, however, declared for the Convention, or, to speak more correctly, against the terrorists; the deputies were delivered from the daggers of the assassins; and Pichegru, at the head of some troops, disarmed the revolted faubourgs. But the Jacobins, though defeated, were by no means subdued. The momentary triumph of the Convention became the signal of partial re-actions; civil war raged in all the provinces of the south; and the royalists, believing that the moment for striking a vigorous blow had arrived, landed at Quiberon an expedition, consisting of the corps of emigrants in the pay of Great Britain. The result of this ill-fated attempt is well known; it was defeated by the energy and activity of Hoche; and the unhappy victims whom the sword had spared were destroyed by the proconsuls of the Convention. Still the power and influence of that body rested on a very precarious foundation. The monstrous government of the provisional committees could not last. A commission named by the Convention was charged with framing a charter; and at its head figured Siéyes, who flattered himself with the idea of establishing an equiponderance of powers, and governing the state by means of popular elections. His constitution of the year III. established a legislative council of five hundred members, and a council of ancients as a chamber of revision. The councils were renewable by thirds annually; and the executive power was intrusted to a Directory of five persons, renewable by a fifth annually, and entirely subordinate to the legislative power. Although these institutions were preferable to the revolutionary committees, yet they were not less dangerous in their application; nevertheless, they were at first received as a plank of safety by a nation fatigued and harassed with all sorts of horrors and revolutions. But the Convention, dreading the influence of their adversaries in the elections, and taking warning by the conduct of the Constituent Assembly, decreed, first, that the electoral bodies, in choosing representatives to the new councils, should be obliged to elect two thirds of the actual members of Convention; secondly, that if two thirds were not returned, the Convention should have the right to supply the deficiency out of their own body; and, thirdly, that the relations of emigrants should be excluded from the exercise of legislative functions. Napoleon

This precaution was incontestably in the interest of the republicans, as it served to postpone for two years a re-action which there seemed good reason to apprehend. But the enemies of the Convention took advantage of the hatred inspired by the Jacobins in order to raise the whole population of Paris against decrees which seemed dictated only by a desire, upon the part of that body, to perpetuate their power. Of the forty-eight sections, there were at least thirty opposed both to the decrees and to the actual members of the Convention; and all of them were armed, each having his battalion in the national guards. The royalist agents were also on the watch to profit by a movement which, if successful, might in a moment change the political aspect of France. Both parties, therefore, resolved to have recourse to force; the Convention, to carry into effect its decrees; and the sections, to constrain it to dissolve itself, in terms of the constitution. In these circumstances, it was proposed to Napoleon to command, under Barras, the armed force destined to act against the Parisians. He consented, upon condition of being left free from all interference, and lost not a moment in sending to Meudon for the artillery. He had five thousand men and forty pieces of cannon, a force more than sufficient to put down a riot, but not too much against a national guard well armed, and provided with artillery; and he was reinforced by fifteen hundred patriots, organized in three battalions.

On the 13th of Vendemiaire (4th of October), the sectionaries marched against the Convention. One of their columns, debouching in the Rue Saint-Honoré, advanced boldly to the attack; but it was instantly checked by the fire of the artillery, which swept the street with grapeshot, and soon afterwards it gave way in confusion. A number of the fugitives attempted to make a stand on the steps of the church of St Roche, where, owing to the narrowness of the street, they were in a great measure sheltered from the fire of the artillery. Napoleon, however, promptly brought a gun to bear upon them, and in a few minutes this crowd was dispersed, leaving behind them a number of dead. The column which debouched by the Port-Royal was not more fortunate. Exposed to the direct fire of the guns stationed below the Tuileries, and taken in flank by

[1] It appears that Robespierre was overthrown by the party of the terrorists themselves, because he had announced that it was time to put an end to their horrid system, and to return to a less expeditious kind of justice. Terror was with him a means, not an end; and it would have ceased with his triumph, as it did in some measure with his fall. The character of this astonishing personage has not yet been well developed, and it is even probable that it will continue to be misunderstood or misrepresented in history.

Napoleon. that of the other batteries by which the bridge was commanded, all its efforts to establish itself upon the quays of the Seine proved unavailing, and, after a very short struggle, it dispersed, and fled in all directions. In less than an hour the whole was ended, and the Convention victorious. This event, so trivial in itself, and which scarcely cost two hundred men on each side, had important consequences. It prevented the revolution from retrograding; it enabled the Convention to disarm the sections; and, above all, it had a marked influence upon the future fortunes of Napoleon. The eminent service he had rendered was immediately rewarded with the rank of general of division; in five days he was named second in command of the army of the interior; and soon afterwards, on the resignation of Barras, he was advanced to the chief command. He had now passed into the order of marked and distinguished men. But the situation which he held was by no means suited to his views. He longed to make war upon a more extended theatre of action, and to profit by the advantages which fortune had thrown in his way.

It was at this time, when his residence in Paris had begun to appear insupportable to his active mind, that he became acquainted with the widow of General Beauharnais, whom he afterwards married. At the moment when the sections were disarmed, the sword of her husband, who had perished by the guillotine, a victim of the tyranny of Robespierre, had been taken from her; and she now sent her son Eugene, a boy of fifteen, to beg that it might be restored to her. Her request was at once complied with, and the boy shed tears as he received from the hands of Napoleon the sword of his unfortunate father. This scene touched Napoleon; and, having gone to give an account of it to the mother of Eugene, he was so enchanted with her elegance and grace, that he soon afterwards made her a tender of his hand, which was accepted. Such appears to be the simple truth in regard to the origin of his relations with Josephine, concerning which so many absurd and injurious stories have been circulated. Napoleon had little relish for the society of women, which accorded neither with his tastes nor his character, and in which he experienced constraint; but, being desirous to fix himself in life, and finding in Josephine spirit and elegance united with celebrity, he resolved to espouse her. The marriage took place on the 9th of March 1796, only a few days before he set out to assume the command of the army of Italy.[1]

Tranquillity being now restored at Paris, the Directory had time to turn their attention to the state of affairs, particularly to that of the army of Italy, the condition of which was by no means satisfactory. It was determined to supersede Schérer, who had disappointed the expectations of the Directory, and to give it a new general; and as the chief command of the army of the interior naturally led to that of an active force, provided the individual holding it possessed the confidence of the government, Napoleon was consequently appointed general-in-chief of the army of Italy. To this command he had pre-eminent, and indeed exclusive, claims. When serving under General Dumerbion, as commandant of artillery, he had turned the important position of Saorgio, and disengaged Genoa, then threatened by the allies; when employed at the board of military operations, he had digested a plan of campaign, the result of which was the signal victory gained at Loano, and the possession of the line of the Apennines, as far as Savona and the sources of the Bormida; and now, when brought into more direct contact with the government, he satisfied Carnot, to whom the direction of military operations was intrusted, that his plan in regard to Piedmont, which had been rejected by the committee of public safety in 1794, might still be executed, with every prospect of success. These circumstances, independently of his services at Toulon, and also against the insurgent sections of Paris, naturally pointed him out as the person best qualified to obtain that success of which the Directory, at this time, stood so much in need, in order to support its credit and consolidate its power. That his talents were fully appreciated, and that to the opinion entertained of them he was solely indebted for this splendid command, admits of no doubt whatever. "Advance this young man," said Barras to one of his colleagues, "or he will advance himself without you." Napoleon quitted his wife ten days after their marriage, and, after a rapid journey, arrived at the headquarters of the army at Nice. From that moment the most brilliant scene of his existence began to open. "In three months," said he, "I shall be either at Milan or at Paris;" and before a year elapsed, he had grown old in victory. Napoleon.

The plan which he proposed for the campaign united all suffrages; for, though at once bold and original, it was, in reality, extremely simple. It had been agreed that he should manœuvre by his right, in order to descend by Montferrat upon Lombardy, directing all his efforts against the Austrians, in the hope of detaching Piedmont from the imperial alliance. The armies of Germany being reorganised, were to resume the offensive by the end of April, and to endeavour to pass the Rhine. Jourdan, who commanded seventy thousand men on the Lower Rhine, was to blockade Mayence with thirty thousand, and to advance into Franconia with from forty to fifty thousand. Moreau, who had nearly an equal number under him, was to mask Manheim, and advance in Suabia; and it was proposed that both should unite in the heart of Bavaria. As to Napoleon, he had no other task to perform than that of advancing on the Adige; provided he succeeded by his victories in detaching Piedmont from the coalition, or in dethroning the king of Sardinia, if the latter should refuse to make peace. In a word, this plan was merely a copy of that which Napoleon had previously drawn up for the committee, and the execution of which that body had recklessly

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[1] At one time any slanderous or infamous story derogatory to Napoleon readily gained credit in this country; indeed, the more slanderous or the more infamous the tale, the greater became the certainty that it would be believed. The credulity of national hatred was not shocked by ordinary improbabilities. For instance, it was commonly said, and, we may add, universally believed, that Josephine was a woman of indifferent character, or worse; that she possessed more than legitimate influence over Barras, the first Director; and that Napoleon, by his marriage with her, cemented his connection with the society of the Luxembourg, particularly with Barras and Tallien, then the most powerful men in France. The common belief, however, is altogether unsupported by evidence, in as far at least as we have been able to discover; and there are many circumstances which seem to show conclusively that both the imputation itself, and the inference deduced from it as to Napoleon's views in marrying this lady, were equally false. It is not denied that her subsequent conduct was admirable and exemplary; that the influence she possessed over her husband was always exerted on the side of humanity; and that she alone could overrule, by gentleness, those ebullitions of passion to which he was liable. Why, then, on the faith of mere slanderous rumour, impeach her conduct previous to her marriage with Napoleon? Is it probable that he who so fully recognised the necessity of discountenancing immorality, and who afterwards drove from his presence and his service all women of questionable reputation, would have done so had he been conscious that he had married a person of doubtful or indifferent reputation? Can any one be so silly as to imagine that the supposed illegitimate influence of such a person was necessary to the man who had saved the government from destruction, and had been appointed commander-in-chief of the army of the interior before he knew of her existence? Napoleon, indeed, always believed that his fortunes were bound up in some mysterious manner with those of this graceful and accomplished woman. But this was the superstition of deep-rooted affection, the fatalism of a love which could never have been excited by the hackneyed endearments of a woman who had carried her virtue to market.

Napoleon. intrusted to the incapable Schérer. Its distinctive characteristic consisted in the mode by which it was proposed to gain access to the fertile regions of Italy. Former invaders had uniformly penetrated the Alps at some point or other of that mighty range of mountains. Napoleon judged that the same end might be more easily attained by turning them; that is, by advancing along the narrow gorge of comparatively level country which intervenes between these huge barriers and the Mediterranean, and by forcing a passage at that point where the last elevations of the Alps pass by gradual transition into the first and lowest of the Apennine range. The military advantages of operating in this direction will be immediately apparent.

Napoleon arrived at Nice on the 27th of March, and there found the army in a very precarious as well as destitute condition. Perched upon the summits of the Apennines, from Savona to Ormea, it was too much disseminated, and its communications with France, running along the coast in a parallel direction between the enemy's line and the sea, were everywhere exposed; whilst the soldiers were in rags, without shoes, and a prey to almost every species of misery.[1] Napoleon lost not a moment in placing the army in more advantageous positions, and in announcing that he was about to assume the offensive, with a view to provide for its wants, at the same time that he consulted its glory. This announcement had the desired effect. The soldiers forgot their privations, and eagerly longed to signalise their courage and devotion under the young chief who had promised to lead them to victory. Having occupied the principal roads leading from Nice to Italy, particularly that which sweeps to the north by Saorgio, and crosses the chain of the Alps at the Col di Tende, forming the great road to Turin by Coni, the Corniche, or road leading to Genoa, along the coast between the rocks and the sea, and other lines of communication, Napoleon demanded of the senate of Genoa a free passage by the city and the Bochetta, along the road leading from Genoa to Alexandria, promising, in return, to carry the theatre of war beyond its frontiers, and to insure it the alliance and protection of the French republic. This demand was exceedingly artful. If the senate complied, Napoleon would debouche by Genoa in order to overpower the left of the Austrians, drive them back on Alexandria, take all the defences of Piedmont in reverse, detach it from the imperial alliance, effect a junction with the army of Kellermann, and pursue Beaulieu as far as the Tyrol. If the senate refused, he foresaw that that body would immediately make a merit of its refusal with the allies, and that the latter would extend their left in order to anticipate the French at the Bochetta; a movement which would place the mass of the enemy's forces at the two extremities, near Ceva and Genoa, and thus leave the centre isolated and exposed. But before this plan could take effect, Beaulieu, excited by the aulic council, had resolved to assume the offensive, and to advance upon Genoa with the third of his army, whilst the remainder occupied the attention of the French in front.

On the 10th of April the Austrian general descended from the Apennines by the Bochetta, at the head of his left wing, and having dislodged the advanced guard of the French from Voltri, attacked three redoubts which covered the important counterfort of the Apennines that descends upon Savona. Two of these redoubts were carried, but, by the intrepid valour of Colonel Rampon, the third was maintained against enormous odds during the whole of the day, and in the night he was reinforced by the division of Laharpe. Meanwhile Napoleon assembled the Napoleon. mass of his forces against the Austrian centre, which had advanced from Sassello upon Montenotte; and on the 12th, Argenteau, who commanded it, was attacked in front and reverse, defeated, and thrown back upon Dego. This first success was the more important, as it completely disconcerted the combinations of the enemy. In order to profit by it, Napoleon, leaving Laharpe to observe Beaulieu, marched against the Piedmontese under Colli, and on the 13th defeated them at Millesimo, cut off Provera with 2000 Austrians, and forced him to lay down his arms on the morning of the 14th. But the defeat of Montenotte having given the alarm to the Austrians, they now sought to concentrate on Dego. Napoleon instantly suspended his march against the Piedmontese, and returning to the Austrians, defeated them in a double combat at Dego; overpowering in succession the corps of Argenteau, and that of Wukassowich, which had hurried to his assistance. He then resumed his operations against Colli, who, pressed with superior forces in front, whilst his left was menaced by Augereau, was obliged to evacuate the camp of Ceva, and forced to retire behind the Cursaglia and the Elero. Napoleon pursued him warmly, and having again beaten him at Vico near Mondovi, drove him behind the Stura as far as Carmagnola. Another battle would have put him in possession of Turin, from which he was distant only about ten leagues, and in which disorder and terror were now at their height. But this calamity was averted by the submission of the court; and at Cherasco the conqueror concluded a sort of armistice, by which the king of Sardinia engaged to deliver up Coni, Alexandria, and Ceva, to withdraw from the coalition, and to send the Count de Ravel to Paris to treat of a definitive accommodation.

Thus, in somewhat less than a month, Napoleon, with an army destitute of everything, had gained six victories, taken twenty-one standards, fifty guns, and several strong places, conquered the richest part of Piedmont, made fifteen thousand prisoners, and killed or wounded ten thousand men; he had reduced the Austrians to inaction, destroyed the army of the king of Sardinia, detached him from the imperial alliance, wrested from his hands the keys of the Alps, and established a solid basis for his future operations. In a few days he had done more than the former army of Italy in four campaigns; he had displayed consummate genius in achieving victory, and proved that he combined with it the still rarer talent of turning it to profit, by promptly gathering up its fruits. But his hopes were not yet realised. To deliver Italy from the German yoke, and to falsify the proverb which regarded that country as the tomb of the French, was the task which he still reserved for himself, and which he hesitated the less to undertake, as the armistice had left him at liberty to direct his whole force against the isolated army of Beaulieu, now too much enfeebled to resist his attacks with any chance of success.

No commander ever appreciated more justly than Napoleon the value of time in military operations. The day after the signature of the treaty of Cherasco, he put his divisions in motion, and directed them upon Alexandria. Beaulieu, having already passed the Po at the bridge of Valenza, which he destroyed, had taken a position at Valeggio on the Ogogno, pushing detachments on the Sesia and to the left of the Tesino. By a very ingenious stratagem, Napoleon had led the Austrian general to believe that he would pass the Po in the neighbourhood of Valenza,[2] and attack his adversary in front on the Tesino, in-

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[1] The allies called the French, in derision, "the heroes in rags," and they were right; the soldiers of the republic, though destitute of every thing, were nevertheless heroes in the best sense of the term.

[2] In order to mislead Beaulieu as to his intentions, Napoleon had caused to be inserted in the armistice with the Piedmontese a clause in which it was stipulated that he should be at liberty to effect the passage of the Po in the neighbourhood of Valenza. The stratagem succeeded beyond his expectation. The intelligence was conveyed to Beaulieu, and completely deceived the unwary Austrian.

Napoleon. stead of operating on his rear; and, under this impression, Beaulieu directed his whole attention to the space between the Ogogno and Valenza. To confirm him in his error, Napoleon moved a detachment on Salo, as if for the purpose of passing the Po at Cambio, and, under cover of this demonstration, carried his army by its right, and rapidly descended the river, himself conducting the van-guard, in order to accelerate its march. He arrived at Piacenza on the 7th of May, closely followed by his divisions, disposed *en échelons;* and immediately commenced the passage of the river by means of the small craft which he found at that place and its environs. On the opposite bank the Austrians had two squadrons, which were promptly repulsed by Lannes, at the head of the van-guard, and the passage continued, though slowly, until the whole army had crossed.[1] Meanwhile Beaulieu, being at length informed of the movement on Piacenza, manœuvred to oppose it; but, instead of advancing vigorously against the portion of the French army which had already passed the river, he took only half measures, insufficient to arrest the progress of the enemy, and resolved to support his left on the Adda, without abandoning the line of the Tesino, where he had placed his right. On the 8th of May General Liptay, commanding the Austrian left, established himself at Fiombino, in front of the French van-guard; but being instantly attacked by Lannes, he was defeated, separated from Beaulieu, and forced back on Pizzighetone. In the night following this affair Beaulieu arrived on the ground where his lieutenant had just been beaten, and some confusion took place at Codogno, which was occupied by the division of Laharpe; but finding himself, with a few battalions, in the presence of a greatly superior force, he was obliged to withdraw, and to endeavour to concentrate his army towards Lodi, where he had a bridge on the Adda, leaving his right to gain Cassano as it best might; an attempt in which it would not have succeeded, if the difficulties inseparable from the passage of a great river had not retarded the march of the French troops.

Although the road to Milan had thus been laid open, yet the possession of that important place could be of but little avail, and would necessarily be very insecure, as long as the enemy were able to maintain themselves behind the Adda. It was therefore of primary importance to force them to retire; and with this view Napoleon marched on Lodi, at the head of the grenadiers and the corps of Massena and Augereau, leaving before Pizzighetone a division to mask that place and cover his right, and taking measures for the safety of his left, by directing Serrurier upon Pavia. On the 10th he arrived before Lodi, where Beaulieu, having retired with the main body of his army to Crema, had left General Sebottendorf with ten thousand men to defend both sides of the Adda. By means of this strong rear-guard the enemy had hoped to preserve the bridge of Lodi, which was defended by twenty pieces of cannon established on the left bank; but they soon found that they had reckoned without their host. A battalion and some squadrons which occupied the town of Lodi were, without much difficulty, dislodged, and the French reached the bridge before the enemy's workmen had time to cut it down. Napoleon instantly formed his grenadiers in close column, and rushed along the bridge. The troops advanced with loud shouts to the attack, but, being assailed by a perfect storm of grape-shot, they hesitated for a moment, and began to waver. The generals, including Napoleon himself, hurried to the front, cheering and animating the men by their example. The effect was electric. The column dashed along the bridge in spite of the tempest of fire which thinned their ranks, overthrew all that opposed their progress, carried the enemy's batteries at the point of the bayonet, and dispersed his battalions.[2] Sebottendorf retreated upon Crema, with the loss of fifteen guns, and two thousand men killed or wounded. This, though only an affair of the rear-guard, was a daring feat of arms; and its immediate consequences were the occupation of Pizzighetone, the retreat of Beaulieu towards the Mincio, and the triumphal entry of Napoleon into Milan, where his presence had become absolutely necessary. As the French troops had been in continued motion for a month, it was judged expedient to allow them some days rest, and hence Beaulieu was not pursued. Napoleon.

Having thus descended like a torrent from the Apennines, overthrown and dispersed all that opposed him, separated Piedmont from the coalition, received the submission of the Dukes of Parma and Modena, driven the Austrians behind the Mincio, and entered the capital of Lombardy in triumph, Napoleon immediately directed his attention to the internal administration of the country, prescribed the measures necessary for the reduction of the citadel of Milan, imposed contributions, and made arrangements for establishing the republican system in Italy; that is, for destroying the ancient regime, in order to substitute in its stead that equality which formed the pole-bolt of the revolution. His career of victory had been one of unexampled rapidity, and he now sought to secure and consolidate the conquests he had made. The intelligence of his success, however, appears to have excited astonishment and suspicion in the minds of the French Directory, who perceived with alarm that their young general had already made himself master of Italy. Scarcely had he reached Milan, when he received orders to divide his army in two; to give up the command of that of Italy to Kellermann, who was to observe the Austrians on the Mincio; and with the remaining 25,000 men, forming an army of the south, to advance upon Rome, and even to act against Naples. But this division of force, at the moment when it was about to contend against all the resources of the house of Austria, was a great deal too absurd to be submitted to by a commander like Napoleon; he answered by resigning his command, and thus saved the army from inevitable destruction. Meanwhile he resolved to drive Beaulieu into the Tyrol, and with this view he addressed to his soldiers one of the most remarkable proclamations that ever proceeded from his pen. He knew well the men with whom he had to deal; he knew that the French soldiery, full of fire and enthusiasm, would be transported by an appeal which awakened in their minds heroic sentiments; he knew that such an address would produce at Rome or at Naples the same effect as it had done at Turin; he knew, also, that in proportion as he exalted the courage of his troops, he struck terror into those of the enemy, and at the same time bequeathed to posterity a monument of his talent for command. The revolt of Lombardy for a moment en-

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[1] No operation in war is more critical than the passage of a great river in the face of an enemy; yet, singularly enough, none has more frequently succeeded. The Po, which scarcely yields to the Rhine in the breadth and depth of its bed, is a barrier difficult to pass. On this occasion, however, Napoleon, although he had no means of constructing a bridge, and was obliged to content himself with the small boats which he found on the river itself, effected the passage, with very trifling loss, and established himself upon the communications of Beaulieu.

[2] The success of this attack was facilitated by the very circumstance which seemed to prognosticate instant failure. Whilst the troops hesitated under the storm of fire with which they were assailed on the bridge, some soldiers slid down by the piles into an island in the river, where they hoped to find some point of attack less exposed to the enemy's fire. Here they discovered that the second branch of the Adda was fordable, upon which a battalion immediately spread itself out *en tirailleurs*, in order to turn the Austrian line; and, thus favoured, the mass of grenadiers passed the bridge at the *pas de charge*.

Napoleon. dangered the success of his plan. On the day when he quitted Milan to advance against the Austrians, the tocsin sounded in the rear of his army; the people flew to arms, and having seized upon Pavia, put the garrison to death. The least hesitation on his part would have rendered this rising general. Without stopping the march of the army, he proceeded in all haste to Pavia, followed by 300 horse and a battalion of grenadiers, at the head of which he forced the gates, penetrated into the city, which was delivered up to pillage, ordered the municipality to be shot, and thus, by one vigorous blow, extinguished the insurrection in its principal focus. At Benasco Lannes acted with equal promptitude and severity; and at Lugo, where a squadron of French horse had been destroyed, a number of the male inhabitants were shot.[1]

After the defeat of Lodi, Beaulieu had not ventured to halt behind the Oglio, nor even behind the Chiesa. He preferred the stronger line of the Mincio, flanked on the left by the fortress of Mantua, and on the right by the Lago di Garda and the mountains of the Tyrol. Behind this barrier he established his army, with his centre posted at Vallegio, his left at Goito, and his right at Peschiera, a small place belonging to the Venetians. As the wings thus rested upon two strong places, Napoleon resolved to force the centre; at the same time making demonstrations on the side of Peschiera, which covered the enemy's line of retreat to the Tyrol. On the 30th of May, he arrived at Borghetto with the mass of his army, and immediately dislodged an advanced guard of the enemy, stationed on the left of the Mincio. Having repaired the bridge of Borghetto, which the Austrians had partly destroyed in their retreat, he was preparing to force the passage of the river, when a column of grenadiers threw themselves into the stream, carrying their arms on their heads, as the water reached to their shoulders. The enemy, believing themselves about to be attacked by the redoubtable column of Lodi, gave way, and, taking the road to the Tyrol, allowed the French to effect the passage without opposition. Beaulieu attempted to make a stand upon the heights between Villafranca and Vallegio; but having learned the movement of Augereau on Peschiera, he immediately retired beyond the Adige, and ascended the right bank by Dolce as far as Caliano. Part of his left ascending the Mincio to join him at Vallegio, came suddenly upon the French head-quarters, and nearly captured the general-in-chief, but was soon dispersed by the troops under Massena; and the remainder of this wing, being detached from Goito, entered Mantua, the garrison of which now exceeded 13,000 men. Thus far the combinations of Napoleon had been completely successful; yet whatever might have been his desire to pursue the remains of Beaulieu's army, he found it necessary to stop. He was not strong enough to penetrate into the heart of the Austrian states, whilst the armies of the Rhine were still behind that river; besides, he had rather overrun than conquered Italy, and the possession of Mantua could alone establish the French power in that country on a solid foundation. The investment of that fortress was therefore decided on; materials for the siege having previously been prepared at Alexandria and Tortona, whence they were directed in all haste on Lombardy.

Meanwhile Napoleon took measures for strengthening himself upon the Adige, where his situation had become complicated, and in fact presented a variety of new combinations. The investment of Mantua required that he should be master of the course of the Adige; and the key of this river is Verona, the position of which forms the basis of every system upon that line of operations. He therefore took it upon him to summon the city, which was surrendered without resistance, on the 1st of June; and by this precious acquisition he procured three fine bridges on the Adige, and a strong central position, defended by bastions, and protected by two forts perched on the last slopes of the Tyrolese mountains, so as to shut up hermetically the valley of the Adige on the left bank of the river. He also placed garrisons in Crema, Peschiera, and other strong places belonging to the Venetians; and having concluded armistices with the king of Naples and the pope, occupied Leghorn, where he seized a large amount of English property and merchandise. The investment of Mantua was now converted into a regular siege, the labours of which were intrusted to Serurier's division, ten thousand strong, whilst the rest of the army remained in observation upon the Adige, as far as the western bank of the Lago di Garda; a position in which, by concentric interior movements, the whole French force might be united on either bank of the Mincio, according to the manner in which the enemy might choose to develope any fresh attack. The trenches were opened on the 18th of July. But a new act of the drama was about to commence. Napoleon.

The cabinet of Vienna, justly alarmed at the progress of Napoleon, had resolved to check his career by opposing to him a new army and a new general. Beaulieu was replaced by Wurmser, who, having set out from Manheim with twenty thousand picked troops drafted from the armies on the Rhine, reached Trent towards the end of July, and there found himself at the head of more than sixty thousand combatants, including the powerful reinforcement he had brought along with him. At this time Napoleon had not more than thirty thousand men under his immediate command, and ten thousand were engaged under Serrurier in the siege. The Austrians had therefore a superiority of force which seemed to insure them the victory. In fact, they already triumphed in anticipation of success, and their calculation seemed just; but in their estimation of the respective forces, they forgot to take into account the relative values of the generals-in-chief, and this slight omission disarranged all. In the last days of July, Wurmser debouched from the Tyrol; Quasdanovich, with 25,000 men, moving by the left bank of the Lago di Garda upon Salo and Brescia; and the marshal, with the remaining 35,000, descending the Adige in three columns. Experience had not yet taught the Austrians the advantage of compact movements, and dearly did Wurmser pay for the blunder which he committed in thus dividing his force, and exposing it to be beaten in detail. Napoleon, on receiving the news of his advance, accompanied with the intelligence that Sauret had been forced back on Dezenzano, and Massena expelled from Rivoli, instantly resolved to attack Quasdanovich before he could form a junction with Wurmser on the Mincio. This was his only chance of success, and to secure it he quitted every thing. The siege of Mantua was raised; a hundred and forty pieces of cannon were abandoned in the trenches; and, by the evening of the 30th, Napoleon had assembled between Peschiera and Goito the divisions of Massena and Augereau, with the reserve of Serrurier's division.

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[1] We have been told that "these bloody examples," though they quelled the insurrections, nevertheless "fixed the first dark and indelible stain on the name of Napoleon Buonaparte." This is easily said, but is it well founded? Was no atonement due for the lives of the brave men who had been cruelly massacred by an infuriate rabble? Upon what principle can impunity be claimed in behalf of assassins? On such an occasion, clemency on the part of Napoleon would have been a crime against his army. "Il faut quelquefois un peu de sang, pour en arrêter une plus grande effusion; pardonner à des perfides qui faisaient succéder le poignard aux acclamations, c'eût été exposer le sang des nos braves à couler dans de nouvelles Vêpres Siciliennes." (*Vie de Napoleon, racontée par lui-meme*, tom. i. p. 109.)

Napoleon. Next day he passed the Mincio to encounter Quasdanovich. The Austrian general, assailed by a superior force, was driven from Lonato, Brescia, and Salo, and compelled to fall back on Gavardo. But this success was not decisive, and the defeat of the Austrian plan of operations might have been repaired, if Wurmser had passed the Mincio on the 31st of July, and occupied Lonato. By this means he would have effected a junction with Quasdanovich, and Napoleon would have been forced to regain in all haste the Tesino or Piacenza. But instead of following the only course calculated to insure success, Wurmser proceeded to make his entry into Mantua, amidst the sound of bells, and did not pass the Mincio to advance upon Castiglione until the evening of the 2d of August; thus allowing Napoleon time to defeat his lieutenant, and drive him from San Marco, Lonato, and even Brescia.[1] On the 3d, Augereau's division, supported by the reserve, advanced upon Castiglione; that of Massena directed its march on Lonato; and Guyeux received orders to debouche on Salo, in order to induce Quasdanovich to continue his retreat by threatening his communications with the Tyrol. Napoleon conceived that he was directing his effort against Wurmser, but, on the contrary, it fell upon the left of Quasdanovich, who was now making another attempt to operate his junction by Lonato, and had with this view resumed the offensive, advancing, as usual, in several isolated columns. As might be expected, the Austrian was again defeated, and, being warmly pursued, was forced to direct his columns on their former position at Gavardo. The same day Augereau attacked and defeated the advanced guard of Wurmser at Castiglione. Napoleon had as yet obtained only partial successes; but they strengthened him in his central position, and gave him the means of dealing heavier blows. The first of these was directed against Quasdanovich, who, on the very next day, was surprised at Gavardo, threatened with an attack in reverse, and obliged to fall back in great disorder upon Riva; thus definitively ridding Napoleon of a corps formidable from its strength, as well as from the strategic direction which had been assigned to it.

But if fortune seconded Napoleon in this juncture, he was at the same instant exposed to the greatest danger in the midst of his very head-quarters. Massena's division had just quitted Lonato, where Napoleon remained with 1200 men, when all of a sudden an alarm was given that the place had been surrounded by an enemy's corps, and soon afterwards an Austrian officer came to summon him to surrender. Happily his presence of mind did not forsake him. He presumed that this could only be one of the detachments of Quasdanovich which had been separated from the main body in the recent affair of Lonato; and he resolved to extricate himself by audacity from a situation which must have been not a little embarrassing. Assuming a menacing tone, "What means this insolence?" said he. "Do you dare to beard the French general in the midst of his army?" The Austrian officer was confounded, and hearing the word "*fusillade*" significantly pronounced by Napoleon, he became so terrified that he consented to surrender. Two thousand men, provided with four pieces of cannon, then laid down their arms, and discovered, when it was too late, that if they had stood firm, the French general-in-chief and all his staff must have been their prisoners. This corps formed the advanced guard of Quasdanovich, which, in executing a reconnoissance with a view to a junction with Wurmser, had crossed on the march the columns of St Hilaire and Sauret, and had fallen upon the French head-quarters at the very moment when the camp of Gavardo was unexpectedly attacked by the French troops. Napoleon.

The combat which decided the final success of this operation took place on the 5th of August, near Castiglione. Wurmser, still infected with the mania of detachments, had pushed one in the direction of the Lower Po, and left another to blockade Peschiera, so that there remained under his immediate orders not more than 25,000 men. The divisions of Massena and Augereau, with the reserve, presented a force equal to that of the enemy, and the arrival of the division of Serrurier turned the balance decidedly in favour of the French. As soon as the latter came up, Napoleon attacked the enemy's left with his right and centre, defeated it, and forced him to repass the Mincio with the loss of twenty pieces of cannon. Massena instantly crossed the Mincio at Peschiera, and falling upon the enemy's right wing, established before that place, routed and put it to flight. Wurmser now perceived that a prompt retreat could alone save him, and, leaving in Mantua a garrison of 15,000 men, he fell back along the valley of the Adige, warmly pursued by the French as far as the entrance of the Tyrol, which he regained with a total loss of 12,000 men and fifty pieces of cannon.[2]

The Austrians, however, had scarcely re-entered the Tyrol, when, being joined by considerable reinforcements, they once more found themselves stronger than their adversaries. It was easy to foresee that they would not suffer Napoleon quietly to effect the reduction of Mantua; and Wurmser, having received positive orders to relieve that place, imagined that he could attain this end without fighting, by means of manœuvres alone. Davidowich was to cover the Tyrol with 20,000 men disseminated from the environs of Feldkirch as far as Roveredo; whilst Wurmser himself, with the remaining 26,000, should descend the valley of the Brenta, to debouche on Porto-Legnago and the rear of the French army. The Austrian general, who supposed that Napoleon's views were as narrow as his own, conceived that his adversary had no other course to follow but to retire behind the Mincio, and that he would thus become the deliverer of Mantua by the sole effect of his combinations. But the young chief of the French army was not the man to allow himself to be deceived by false demonstrations. At the moment when Wurmser was meditating this false movement, Napoleon received a reinforcement of 6000 men from the army of the Alps, and being thus strengthened, he resolved to penetrate into the heart of the Tyrol, and to fall upon the right of Wurmser at the moment when he was draining the Tyrol in order to manœuvre by his left. He directed on Roveredo the divisions of Augereau and Massena posted at Verona and at Rivoli, and these were to be joined on the march by the division of Vaubois, debouching from Salo by the western bank of the Lago di Garda; a force which could scarcely fail to overpower the corps of Davidowich, left alone to guard the Tyrol, and dispersed in several detachments. On the 4th of September, Wukassowich, who commanded his advanced guard, was expelled from the camp at Mori, and driven back, first on Roveredo, and then on Calliano, where he formed a

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[1] The Austrians seem never to have known the value of time in war. They occasionally form able plans; but it is always by the calculation of distances or of time that they misgive.

[2] The theatre of Wurmser's defeat was that on which Prince Eugene had succeeded so well in his celebrated campaign of 1705 against the Duke of Vendôme; and if these events be compared, it will be found that Napoleon displayed more ability than the general of Louis XIV. Although Vendôme had Mantua for him, whilst Napoleon had it against him, yet he had not the skill to maintain himself on the Adige and the Mincio, and allowed himself to be assailed on the left by Prince Eugene, who transported his infantry in boats by the Lago di Garda to Gavardo. This movement lasted six days; but in half that time Napoleon would have destroyed an army which ventured to perform such an operation in his presence.

Napoleon. junction with the mass of the corps. The position of Calliano seemed inexpugnable; but Davidowich, being attacked by a greatly superior force, was compelled to abandon this redoubtable gorge, leaving in the hands of the assailants twenty-five guns and two thousand prisoners. The Austrians retreated in the greatest disorder, and next day the French entered Trent. Meanwhile Davidowich rallied the remains of his corps behind the Lavis; Napoleon, however, resolved to dislodge him; he was attacked by Vaubois, and having in vain attempted to defend the passage of the river, he was thrown back upon Salurn and Neumarck.

In the course of this victorious march, Napoleon learned the movement of Wurmser on the Brenta; but, far from being intimidated by it, he judged rightly that it would become to him a more certain pledge of victory. An army divided into two, with its centre penetrated, its right overthrown, and its left at once isolated and turned; what more could he desire? The occupation of Trent was the more important that, in opening to the French the head of the valley of the Brenta, it also uncovered the rear of Wurmser. Napoleon was not the man to let slip so favourable an opportunity. He resolved at once to profit by the false movement of the enemy, and not to allow him time to destroy the troops that remained before Mantua. On the 6th he directed Massena and Augereau by Levico in the valley of the Brenta, in order to mask his own movement, and keep Davidowich in check; whilst Vaubois was left upon the Lavis. On the morning of the 7th the advanced guard of Augereau encountered and overthrew a strong detachment of the enemy, posted at Primolano to guard the passage of the gorges of the Brenta, and which, being pursued by a regiment of dragoons, was overtaken and obliged to surrender. Wurmser had already attained Bassano, where, finding that Napoleon was marching upon his communications, and not knowing whether to advance or retreat, he took up a position on the heights in advance of the town, placing his vanguard at Solagna and Campo-Lungo. Here the latter was attacked, on the morning of the 8th of September, and driven back in disorder on Bassano. The French instantly pursued, and reaching the town close on the heels of the fugitives, carried it by main force. Not knowing where to make head, Wurmser, with the left of his *corps de bataille*, retired on Fonteriva, where he passed the Brenta, and took the direction of Vicenza; whilst Quasdanovich, with the right, finding it impossible to gain the Brenta, fell back upon Friuli. In this affair, two thousand prisoners, thirty pieces of cannon, and an immense quantity of baggage, fell into the hands of the French. The situation of Wurmser seemed desperate. His communications with Austria were intercepted; he had lost the greater part of his artillery and baggage; and he now found himself in a country, all the outlets of which were in the hands of the enemy, with little more than 14,000 men, discouraged by repeated discomfitures. Nothing, therefore, remained for him but to endeavour, at any sacrifice, to throw himself into Mantua, and there await the arrival of fresh succours from Austria; and such, accordingly, was the resolution adopted by the gallant veteran, who, though outwitted and out-generalled, was not dispirited by defeat.

But to accomplish this object, it became necessary to force a passage somewhere on the Adige; and the Austrian general, having lost his pontoon train, seemed destitute of all means of escape, and about to be overwhelmed by the forces skilfully directed to prevent his escape. A mistake committed by Sahaguet, however, proved the means of his salvation. That officer, who was at Castel- Napoleon. lano, had received positive orders to cut down all the bridges of the Molinella, and to avail himself of this obstacle to arrest the enemy; but, happily for the Austrian, he forgot that of Villa Impinta, by which Wurmser was enabled to escape the certain destruction that awaited him, and, after a series of bloody skirmishes, in which fortune divided her favours pretty equally, to throw himself into Mantua.[1] He had flattered himself with appearing before that fortress at the head of 26,000 victorious troops; but in reality he threw himself into the place with no more than 12,000 men, discouraged by defeat, and, instead of raising the siege, about to be themselves invested. At first he encamped his troops without the place, between the suburb of St George and the citadel, in the hope of keeping the field, and collecting supplies from the country; and, in this position, some partial advantages obtained over the troops of Sahaguet and Massena, on the 13th and 14th, inspired him with a security which Napoleon lost no time in punishing. The entire garrison having sallied out to forage on the 15th, Napoleon attacked them with his whole force; penetrated as far as St George, which he carried at the point of the bayonet; and having compelled Wurmser to retire within the body of the place, completed the investment of the city and the fortress. The charge of the blockade was intrusted to General Kilmaine, with Serrurier's division, and the rest of the army were placed in observation before the Tyrol.

The position of Napoleon, however, was by no means without difficulty, to say nothing of danger. The defeat of the French armies of the Rhine rendered it highly probable that Austria would reinforce her army in the Tyrol and in Friuli, and make fresh efforts to deliver Mantua; Wurmser was in his rear, at the head of an army of more than 20,000 men; the French troops were established in a marshy country, where malignant fevers usually prevail in autumn; and the political horizon of the south of Italy began to assume a very threatening aspect. On the other hand, in order to strengthen the French interest, new republics were founded; the pope, through the interference of Spain, was prevented from throwing himself into the arms of Austria; peace was concluded with Naples; a treaty was concluded with Genoa, which had agreed to shut its port against the English; and the French party had triumphed in Corsica. To counterbalance these advantages, the epidemic fevers had encumbered the hospitals, diminishing considerably the number of combatants; reinforcements arrived too slowly to repair the losses which had been sustained; and the Austrians were actively preparing once more to try the fortune of arms. By the middle of October, Davidowich had received reinforcements which raised the force of his corps to 20,000 men; that of Quasdanovich now amounted to 25,000 combatants; and the Croats were permanently organised into regiments, to facilitate the arrival of the levies drawn from the Tyrol, and the recruits raised in the interior. The supreme command was conferred on General Alvinzi, a veteran of high reputation, who, having joined the corps of Davidowich, resumed the offensive, directing that corps by Bassano on Verona, where he hoped to effect a junction with Davidowich, who had received orders to descend the Adige.

Napoleon's situation had thus become extremely critical. He could not advance to encounter Alvinzi without abandoning Verona, and consequently enabling Davidowich to overthrow Vaubois, unite with Wurmser under Mantua, and thus establish in his rear an army superior in number to all the troops he had been able to collect. On

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[1] Napoleon never forgave Sahaguet for this oversight, which deprived him of one of the fairest fruits of his victory of Bassano. His plan had been so ably formed, that, but for Sahaguet's blunder, the destruction of Wurmser would have been inevitable.

Napoleon. the other hand, he could not concentrate the mass of his force on Roveredo without opening to Alvinzi the road to Mantua, which, in an inverse sense, would have led to the same results. There was also an inconvenience in assembling the mass of his troops at Verona, since in this case the communication between Alvinzi and Davidowich would have been re-established by the valley of the Brenta. Nevertheless, as it had become almost equally necessary to prevent the junction of these two generals, and to oppose the union of one of them with Wurmser, the adoption of a mean term, or intermediate plan, was the only course that remained open to Napoleon.

Vaubois was too weak to defend the approach to Trent; but, in ordering him to assume the offensive, Napoleon hoped to impose on Davidowich. In this, however, he was deceived. On the 3d of November Vaubois was forced to fall back on Calliano; on the 4th Davidowich entered Trent; and on the same day the army of Alvinzi arrived at Citadella and Bassano. At the approach of the enemy Massena fell back on Montebello. Davidowich now marched on Calliano, and Alvinzi prepared to move upon Verona by Vicenza. Napoleon now decided to repeat from right to left the manœuvre which had succeeded against Wurmser from left to right; that is, after first trying to defeat Alvinzi, and drive him behind the Piave, he proposed to ascend the Brenta, in order to fall upon the rear of Davidowich. With the divisions of Augereau and Massena he advanced towards the Brenta, which the enemy had already passed, and on the 6th attacked their left under Provera at Carmagnano, and their right under Quasdanovich at Lenove, though with only partial success. Provera repassed the Brenta, and Quasdanovich withdrew to Bassano, without suffering any serious loss. Meanwhile Vaubois, being warmly pressed on the Adige, was, after two days' fighting, driven from the strong position of Calliano, and obliged to retreat on La Corona. Napoleon flew to this division, harangued the 39th and 85th regiments, which had given way at Calliano, and threatened to inscribe on their colours that they were no longer worthy to belong to the army of Italy. Moved with these reproaches, the soldiers shed tears, and swore to conquer or die when next led against the enemy. Napoleon, however, found it necessary to renounce his projects, and to retire on Verona, where he established the head-quarters of the army. The whole country between the Brenta and the Adige being now in the hands of the enemy, the French general began to be closely pressed, and, not choosing to be more so, resolved once more to fall upon Alvinzi. On the 11th he left Verona with the divisions of Massena and Augereau, and next day attacked the enemy, whom he found in position at Caldiero. But a violent tempest which beat in the faces of the troops, and the strong position of the enemy, rendered all his efforts unavailing; he was repulsed with loss, and forced to return to Verona, where his situation now became more critical than ever. He was everywhere too weak; and the fortune which had hitherto so signally befriended him, seemed at length to abandon her favourite. Any other general, in his circumstances, would have thought only of repassing the Mincio, and would thus have lost Italy. But in war it often happens, that to gain all, a general must risk all. Reduced to this predicament, Napoleon determined to pass the Adige below the left of Alvinzi, and thus to act on his rear. The project was hazardous in itself; but it was nevertheless wise, because it was the only one which still left him some chance of success.

General Alvinzi, in presenting himself before Verona by the Caldiero road, had on his right impracticable mountains, on his left the Adige, and in front a place secure against a *coup-de-main*. The ground which he occupied, being thus closed upon three sides, had no other outlet than the defile of Villa Nova, by which alone he could retire in the event of defeat. By passing to Ronco, Napoleon would therefore approach this defile, oblige the enemy to fight *face en arrière*, in order to open a passage, and place his inferior army on marshy ground, traversed by three dikes, where he would have all the advantage of the defensive, joined to the individual superiority of his soldiers. It has indeed been said, that by passing at Albaredo, Napoleon would have avoided the Alpon, its marshes, and the defile of Arcole; and it is certainly true that he would thus have more easily gained Villa Nova, which was the great object of his movement. But he was not strong enough to throw himself headlong on the only road of Alvinzi; all he could do was to menace this communication, without quitting the support of the Adige, and at the same time approaching as quickly as possible to Verona and the division of Vaubois. The movement on Albaredo would have been too wide to accomplish this triple object; and besides, it would have been too hazardous to offer battle on the Alpon at Villa Nova, facing to the rear in the direction of Verona. The project which he actually executed was sufficiently daring, inasmuch as the unsafe nature of the ground, and the narrowness of the dikes, by which alone he could advance on Arcole, rendered victory difficult, whilst a serious reverse would have decided the fate of the campaign, and that of Italy. Napoleon.

Having recalled Kilmaine with two thousand men from the blockade of Mantua, Napoleon confided to him the defence of Verona, which it was the more indispensable to maintain, as it barred the passage of the Adige, and prevented Alvinzi from giving his hand to Davidowich; and on the night of the 14th of November, he set out from Verona for Ronco, where he threw a bridge over the Adige. On the 15th he passed the river, with the divisions of Massena and Augereau, and the reserve of cavalry, forming in all about 20,000 men, and advanced by the three dikes which conduct to Arcole. A brigade of Croats, however, profiting by the advantages of the ground, repulsed the attack of Augereau, whose column had been directed on the bridge of Arcole, and afforded time to Alvinzi to come to their assistance. The latter also sent Provera with six battalions to attack Massena at Porcil, and with the mass of his army retrograded on St Bonifacio. But this unforeseen obstacle did not discourage Napoleon. Perceiving that if he could not attain Villa Nova by the left bank of the Alpon, he might act more directly by Porcil on Alvinzi's line of retreat, and sensible that, with this view, as well as to secure his right, and prevent himself from being taken in a *cul-de-sac*, it had become absolutely necessary to make himself master of the village and defile of Arcole, he made fresh efforts to carry the bridge. The greater part of his generals being wounded, he seized a standard, and urged his grenadiers once more to the charge. They advanced boldly amidst a tremendous fire; but the head of the column being shattered, the troops gave way, and Napoleon being thrown into the marsh, was in imminent danger of being taken. At this critical moment Belliard charged with a company of grenadiers, and rescued the general-in-chief, when about to fall into the hands of the enemy. Nevertheless, towards evening, the Austrians abandoned Arcole, on the approach of a brigade which had passed the Adige at the ferry of Albaredo, and was advancing along the left bank of the Alpon. But it was now too late; and Napoleon, not choosing to run the risk of passing the night with his troops crowded in the marshes, in presence of the hostile army deployed between St Bonifacio and San Stephano, and fell back to Ronco, on the right bank of the Adige.

The combat of the second day proved not more decisive than that of the first. It was maintained with equal bravery on both sides; and in the evening, Napoleon, from the same motives as before, repassed the Adige. But the third conflict proved decisive. At daybreak on the 17th, the French

Napoleon. troops resumed their march to the bridge, and drove back the Austrians on Porcil and Arcole. It was not against this point, however, that Napoleon had resolved to direct his principal efforts. Leaving Robert with a demi-brigade to keep the enemy in check, he therefore directed Massena with another demi-brigade on Porcil, whilst the rest of his division remained in reserve near the bridge; and he ordered Augereau to throw a bridge over the Alpon, near the embouchure of the rivulet, so as to be in a condition to act against the Austrian left, and thus take Arcole in reverse. As Napoleon had foreseen, the Austrians, reinforced at Arcole, assumed the offensive, and drove back Robert, whom they pursued with reckless impetuosity. Proud of this success, their deep column continued to advance, and suddenly came upon the main body of Massena's division, placed in ambuscade amongst some willows, who instantly assailed them in flank, cut off three thousand men, and forced the remainder to retire in disorder on Arcole. The decisive moment had now arrived. Augereau developed his attack, whilst some cavalry appeared on the enemy's flank; Massena debouched by Arcole and St Gregorio; the little garrison of Legnago threatened the enemy's rear; and the latter, unable to maintain themselves in ground favourable for acting on the defensive, were reduced to the alternative of either accepting battle in an open country, or commencing a precipitate retreat. Alvinzi durst not risk the former, and on the 18th he retired on Montebello, leaving Napoleon at perfect liberty to turn upon Davidowich.

This general, who, during eight days, had amused himself before the intrenchments of La Corona, at length attacked Vaubois on the 16th. The latter maintained his ground, but the following day retired behind the Mincio at Peschiera. On the 18th Davidowich advanced to Castel Novo. Resolved to punish him for this rash movement, Napoleon sent only the reserve of cavalry in pursuit of Alvinzi, and with the main body of his infantry fell back from Villa Nova upon Verona, which he entered in triumph. He then directed the divisions of Massena and Vaubois to attack Davidowich in front, whilst Augereau advanced from Verona upon Dolce to cut off his retreat; a combination which would have insured his destruction, had he not accidentally learned the defeat of Alvinzi, and hastened to regain Roveredo, which he effected with much difficulty, and the loss of his rear-guard. Alvinzi, on his side, seeing himself followed only by cavalry, returned to Villa Nova; but as Napoleon had already disposed of Davidowich, and was now preparing to debouche once more by Verona on the left bank of the Adige, the Austrian, separated from his lieutenant, did not venture to keep the field, and immediately fell back behind the Brenta. Meanwhile Wurmser remained quietly in Mantua. Alvinzi, in commencing his operations, had calculated that he could not appear before Mantua until the 23d of November, and had engaged Wurmser not to make any sortie until that day. But things not having turned out as the enemy had hoped, this projected effort proved fruitless. Kilmaine had already returned with his detachment, and the corps employed in the blockade succeeded without difficulty in repulsing the besieged. The rapid combinations of Napoleon had thus rendered abortive all the efforts of Austria; a fourth army had been baffled; and for two months after the last day of Arcole, the French general remained undisputed master of Lombardy. To him this interval was of great importance, as it enabled him to take the necessary measures for consolidating his conquests, and also to procure reinforcements sufficient not only to put him in a condition to maintain himself, but also to insure the fall of Wurmser, and to strike a blow at the very heart of the Austrian monarchy.

All that Napoleon had yet done seemed like the web of Penelope; it was invariably undone by the constancy with which the cabinet of Vienna reinforced its army of Italy, and by the negligence of the Directory, which had so long delayed to afford him adequate support. In fact, he was treated by the government of France as Hannibal had been by the senate of Carthage. But public opinion forbade the sacrifice of a general and an army that had gained so many victories; and, as the battles of Arcole showed that both were within a hair's breadth of being expelled from Italy, it was at length resolved to adopt decisive measures. Accordingly, the fine divisions of Bernadotte and Delmas, drawn from the armies of the Rhine, were, notwithstanding the winter, directed across the Alps, and, on joining the French army, would have made its total strength about 75,000 men. On the other hand, by the end of December, Alvinzi having under his orders upwards of 40,000 men, resolved to descend from the mountains, and make another effort for the relief of Mantua. For the fourth time, therefore, the possession of that important place was to be submitted to the arbitrement of arms. Napoleon.

Whilst waiting the arrival of the reinforcements which he expected from the Rhine, Napoleon, apprized that Alvinzi had assumed the offensive, flew to the Adige, to watch the development of his attack. At this moment the division of Serrurier was before Mantua; that of Augereau occupied the line of the Adige from Verona to Legnago and beyond it; Massena was at Verona; and Joubert, with a fourth division, held the important positions of La Corona and Rivoli. Each of these divisions was about ten thousand strong, and Rey, with a reserve of four thousand, occupied Desenzano. The imperialists, as if determined to profit by no lesson, advanced at once on the centre and the two wings of the French army, by Roveredo, Vicenza, and Padua; but Napoleon, as he had not yet ascertained in which of these three directions Alvinzi was carrying the mass of his force, resolved to keep his positions until the Austrian general had developed his projects. On the 12th of January 1797, the column which advanced by Vicenza approached Verona, and drove in the advanced posts of Massena. But the division of that general having debouched on St Michel, the enemy was repulsed with loss; and Napoleon acquired the certainty that he was not in force upon that point. Next day, however, he received intelligence that Joubert, pressed in front by superior forces, and threatened by strong columns on his two flanks, had been obliged in the morning to evacuate the position of La Corona, and to fall back on Rivoli, whence he reckoned on continuing his retreat on Castel Novo. All doubt as to the enemy's projects was now at an end. It was clear that the column of Vicenza, and that which directed its march on the Lower Adige, were only diversions to facilitate the march of the principal corps, which was advancing by the valley of the Adige. The great object of Napoleon, therefore, was to beat this corps, by attacking it with the main body of his army. He instantly set out from Verona, with the greater part of Massena's division, leaving two thousand men to keep in check the column of Vicenza; and at the same time he sent orders to Rey to advance from Salo on Rivoli, where he had resolved to assemble the mass of his force. As Alvinzi had not only weakened himself by the corps directed on Verona and Legnago, but had even disseminated the troops under his immediate orders, Napoleon saw that, by occupying the plateau of Rivoli, where the different paths which traverse that mountainous country unite, he would gain the advantage of acting in a mass against columns separated from one another by insurmountable obstacles. With this view, he sent orders to Joubert to maintain himself, at any sacrifice, in advance of Rivoli until his arrival.

When these orders reached Joubert, however, he was in full retreat; but he instantly countermarched his division, and regained the position of Rivoli, which the enemy had Napoleon.

Napoleon. not yet had time to occupy. Soon after midnight Napoleon arrived. It was a fine clear moonlight, and by the enemy's watch-fires, which illuminated the white peaks of Montebaldo, he could easily distinguish five separate encampments. On the morning of the 14th he made his dispositions for battle, and commenced the attack by directing Joubert against the Austrian centre, whilst a demi-brigade was detached to keep in check Lusignan. The enemy sustained the shock with great firmness, and, becoming the assailant in his turn, forced Joubert to give way; Vial, who commanded the right, also retrograded; and the plateau seemed about to be carried. At this critical moment Napoleon, favoured by the vigorous stand made by one of his regiments in the centre, flew to the left, whither he directed the column of Massena, which had just arrived; the enemy were repulsed, and the French left established itself on the heights of Trombalora. The danger, however, was not yet past. The right was warmly pursued by the Austrians, who had descended from the heights of San Marco; Quasdanovich, having forced the intrenchments of Osteria, was also beginning to ascend the plateau of Rivoli; and Lusignan was moving by Affi upon the rear of the French. Napoleon was, in fact, surrounded; but an instant's reflection convinced him, that if he could overpower Quasdanovich, he would have nothing to fear from Lusignan, and that matters might easily be re-established on the right. This intuitive judgment decided the fortune of the day. As soon as the head of Quasdanovich's column appeared on the plateau, it was assailed on both flanks by the infantry, and in front by the cavalry under Lasalle; and being forced back into the ravine, it was thrown into complete disorder by the explosion of an ammunition waggon in the midst of the troops when crowded together in the hollow. Confusion and terror reigned supreme; infantry, cavalry, artillery, fled pell-mell by Canale. Having thus got rid of Quasdanovich, Napoleon directed his efforts to support Vial, who was now in full retreat. The Austrians, pursuing with headlong impetuosity, had got into disorder, when a charge of two hundred horse completed the confusion; the panic communicated itself to the centre, which immediately disbanded; and it was only behind the Tasso that Alvinzi succeeded in rallying the fugitives. The fate of Lusignan was now sealed. Attacked by Massena in front and by Rey in the rear, his corps was destroyed, and he regained Montebaldo with only a few hundred men.

On the evening of the battle, however, Napoleon learned that Provera, having forced the centre of Augereau's division, scattered along the Adige, had succeeded in passing the river at Anghiari on the 13th, and was directing his march on Mantua. On the 14th the Austrian general was at Nogara, and on the 15th he arrived before Mantua, into which he hoped to make good his entrance by the suburb of St George. But finding it retrenched and occupied by the besiegers, he next day attacked the post of La Favorita, whilst Wurmser sallied out against that of San Antonio. Serrurier, however, succeeded in maintaining his ground; Wurmser retired into the body of the place; and Provera, assailed on all sides by the forces which Napoleon had promptly directed against him, was forced to lay down his arms. Meanwhile Joubert, acting with equal vigour, pursued Alvinzi without intermission, turned both his flanks, and getting upon his line of retreat, made 5000 prisoners. Having lost half his army, the Austrian general now withdrew the remainder behind the Piave, leaving only 8000 men for the defence of the Tyrol; and the French army resumed the positions which it had occupied before the combats of Arcole. Such, then, was the famous battle of Rivoli, in which Napoleon, with only thirty thousand men, made twenty thousand prisoners. But its most important result was the capitulation of Mantua, which surrendered on the 2d of February, thus rendering the French undisputed masters of Lombardy. The terms granted to Wurmser were much more favourable than he had any reason to expect, with a garrison reduced to the last extremity, and suffering from almost every species of privation and misery.[1] Napoleon.

Whilst Napoleon was at blows with Alvinzi, the court of Rome, seduced by the instigations of Austria, had broken the armistice concluded in the month of June immediately preceding, and raised a considerable body of troops, the command of which was intrusted to General Colli, whom the cabinet of Vienna had sent for the purpose. Thinking it necessary to punish this hostile demonstration, partly as an example to others, and partly also to get rid of an enemy seldom dangerous but always inconvenient, Napoleon formed a division, which he placed under the command of Victor, and directed to march upon Imola in the Romagna, where it arrived on the 2d of February, the very day on which Mantua capitulated. The campaign was neither long nor bloody. A corps of 4000 papal troops, which attempted to defend the Senio, was totally routed; Faenza was carried at the point of the bayonet; and Colli, with about 3000 men, were made prisoners. On the 9th Victor arrived at Ancona, where he compelled 1200 men to lay down their arms; on the 10th his van-guard entered Loretto, and rifled the treasury of the Santa Casa; and by the 18th he had reached Tolentino, where his progress was stopped by the conclusion of peace. The terms were such as Napoleon thought fit to dictate. The pope confirmed the cession of Avignon, the Comtat, and the legations of Ferrara and Bologna; he also ceded the Romagna, obliged himself to pay a contribution of L.1,200,000, and agreed to execute, in the fullest manner, the provisions of Bologna respecting works of art. These stipulations were too harsh not to render the holy see an irreconcilable enemy; but they were not severe enough to deprive it of all means of future hostility.

The splendid victory gained at Rivoli, the surrender of Mantua, the evacuation of Corsica by the English, the peace with Naples and Rome, and the approach of powerful reinforcements, having completely changed the face of affairs in Italy, Napoleon, being now definitively assured of that country, hastened to carry the war into the hereditary dominions of Austria. The divisions drawn from the army of the Rhine having arrived in the course of the month of March, he found himself at the head of 75,000 veteran troops; but of this number he was obliged to detach about 20,000 to garrison strong places, and to observe the southern part of the peninsula. With the remainder, however, he resolved to advance against the enemy; and the Directory, with a view to second him, ordered Moreau to repass the Rhine at Kehl, whilst Hoche, after re-organizing the army of the Sambre and Meuse, should again advance upon the

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[1] At the time of the surrender, the garrison, though much weakened by disease, amounted still to 13,000 men under arms, who were declared prisoners of war, and sent to Trieste, to be there exchanged. In Mantua, Napoleon found the battering train which he had abandoned in the trenches at the epoch of Castiglione, and 350 pieces of cannon on the ramparts or in the arsenal.

On this occasion the French general acted with equal delicacy and generosity towards his gallant but unfortunate adversary. When the aged veteran came out to surrender his sword, he found only Serrurier ready to receive it, Napoleon having generously avoided being present to witness his humiliation. The terms granted to Wurmser were also more favourable than the Directory approved. But the victorious general treated their remonstrances with scorn. "I have granted the Austrian," said he, in reply to their expostulations, "such terms as were, in my judgment, due to a brave and honourable enemy, and to the dignity of the French republic." This is one of the most pleasing traits in his history, and gives a favourable impression of the natural character of the man.

Napoleon.

Meyn. The cabinet of Vienna had entertained the idea of carrying the theatre of the war into Italy; but it was not till after the capture of Kehl by the Archduke Charles, and the disaster of Alvinzi at Rivoli, that it was resolved to act upon this principle. Accordingly, about the middle of January, the archduke, who had just distinguished himself by a masterly campaign, set out with three divisions of chosen troops, to traverse the Tyrol, and to oppose the conqueror of Italy. Meanwhile, as the divisions of Bernadotte and Delmas had actually joined the French army, whilst the Austrian reinforcements were as yet only traversing Bavaria, Napoleon, finding himself ready to take the field before the enemy, resolved to profit by this advantage, anticipate his adversary, and attack him *à outrance*, before his whole force should be assembled. Having arranged his plan of operations, and recalled Victor from Ancona to the Adige in order to cover his communications, he put his army in motion on the 10th of March, and with the mass of his force advanced towards the Tagliamento.

To give the details of the sixth campaign, which now commenced, would only be to repeat the story which has already been five times told. The archduke, fettered, it is said, by the aulic council, found himself obliged to execute a plan which he had judgment enough to condemn; in other words, to repeat the error, which had so often proved fatal, of acting on a double line of operations. But there is no reason to believe that he was thus trammelled by any preconcerted plan. His first interest was to avoid a decisive battle before the arrival of those reinforcements which were marching to join him; and upon this principle all his movements were regulated. On the other hand, the plan of Napoleon had for its main object to force him, at all hazards, to fight, or so to cripple him that the arrival of the divisions from the Rhine would have no material effect upon the results of the campaign. In order to attain this end, he had the choice of two lines of operations; one to the north, by the valley of the Adige or the Tyrol; and the other to the east, by Friuli and Carniola. Both of these lines, which form a right angle having its vertex at Verona, were occupied by the Austrians; but Napoleon preferred the latter for various reasons, more especially because, if the enemy should attempt to defend Friuli behind the parallel positions of the Piave, the Tagliamento, and the Isonzo, his right wing, in rear of which was his only line of retreat, might be turned by the coast, and his army defeated and driven into the Adriatic. This consideration alone determined the choice of Napoleon. Besides, as the reinforcements from the Rhine had not yet joined, the Austrian army did not exceed 35,000 men; whilst Napoleon had under his immediate command 38,000, supported by three divisions under Joubert amounting to 17,000 men.

As already mentioned, Napoleon put his army in motion on the 10th of March, and advanced straight towards the Tagliamento, whilst Massena was directed to move on Feltre, in order to push the brigade of Lusignan, left in observation on the Piave, and also to menace the right of the archduke. This secondary movement was immediately successful. Lusignan retired, ascending the Piave; but on the 13th, his rear-guard, being overtaken at Longaro, was overpowered, and the general himself made prisoner. Satisfied with having thrown the Austrian brigade on Cadore, Massena now directed his march on Spilimbergo and Gemona, in order more effectually to turn the Austrian right, and occupy the important route of Poteba, of which the enemy might take advantage in order to retire upon Villach. On the 16th Napoleon arrived at Valvasone, on the Tagliamento. The archduke had already commenced his retreat, leaving only a rear-guard on the Tagliamento. But the river being fordable, the French columns rushed into the stream, overthrew the enemy, and pursued them along the road leading to Palmanova. Prince Charles having now divided his army, he himself fell back on Goriza; one of his columns, commanded by Gontreuil and Bayalitsch, with the greater part of the matériel, moved by Cividale and the valley of Natisono upon Caporetto; and Ocksay, with the brigade of Lusignan, covered the road from Villach to Chiusa-Veneta. But the Isonzo, from its source as far as Goriza, flows between two chains of mountains which are nearly impassable on the side of Krainburg. Napoleon, therefore, manœuvred against the left flank of the archduke, with the view of throwing him back into the valley of the Isonzo, where his army would have found themselves in the Caudine Forks; and, for a moment, he entertained some hope of accomplishing his object. The left of the enemy was covered by the town of Gradisca, occupied by four battalions. On the 17th Bernadotte attacked the place in front; whilst Serrurier, passing the Isonzo between the city and Montefalcone, took it in reverse, and forced the garrison to capitulate. Directing Guyeux by Cividale on Caporetto, Napoleon now ascended the left bank of the Isonzo, for the purpose of cutting off the enemy from the road of Czernita, or obliging him to plunge into the valley of the Isonzo by Canale. But as soon as the French general had developed his movement, the archduke fell back, in all haste, upon Laybach, taking the road by Czernita and Adelsberg, closely followed by Bernadotte. Disappointed in one object, Napoleon instantly turned his attention to another, and directed all his efforts against the column of Gontreuil and Bayalitsch, which, being headed by Massena at Tarvis, was thrown back into the gorges of Oberpreth, and being there surrounded, was forced to lay down its arms. On this occasion, 4000 prisoners, twenty-five pieces of cannon, and 400 baggage waggons, fell into the hands of the conquerors.

From Laybach the archduke had marched by Klagenfurth on St Veit, where he was joined by the first of the reinforcements sent from Germany; but not believing himself even yet in a condition to deliver battle, he fell back upon Neumarck, and on the 30th Napoleon arrived at St Veit. On the 2d of April Massena forced the gorges of Dirnstein, and at Neumarck and Hundsmarck defeated the enemy's rear-guard, consisting of the grenadiers who had just arrived from the Rhine. The archduke continued his retreat on Vienna, and on the 5th Napoleon arrived at Judenburg. But the contest had now reached its term. Two days afterwards, the Austrians, who had received instructions from Vienna touching a letter which Napoleon had addressed to Prince Charles from Klagenfurth, manifesting a desire of accommodation, demanded an armistice, with a view to treat of the preliminaries of peace. To this proposal Napoleon gladly consented. His position was in fact more brilliant than solid. He had not sufficient force to strike a decisive blow against the Austrian monarchy; the armies of the Rhine, notwithstanding the superiority which they had acquired since the departure of the archduke, still remained inactive in their cantonments; he could not for a long time hope for any effectual co-operation on their part; a suspicion even crossed his mind that the government wished to sacrifice him, by causing him to be beaten; and, besides all this, he had just cause of disquiet in regard to his communications, which were seriously endangered by an alarming insurrection in his rear. In these circumstances, the negociations speedily advanced towards a favourable issue; and, on the 18th of April 1797, the preliminaries of peace were signed at Leoben, to which the French head-quarters had been transferred.[1]

[1] The views of Napoleon, on this occasion, were admirably seconded by the cabinet of Vienna; and the precipitation it displayed in the negociations disclosed the terror which his successes had inspired. With his characteristic penetration, he availed himself of the anxiety thus manifested to dictate the law in regard to the provisional treaty.

Napoleon. The conclusion of peace with Austria was almost immediately followed by the annihilation of the republic of Venice. The government of that state had done every thing to call down the vengeance of the conqueror. Being exasperated by a democratical movement which occurred at Brescia and Bergamo, it had taken advantage of the approach of an Austrian column under Laudon, to excite a general insurrection in rear of the French, and thus endanger the communications of the army whilst engaged in a series of complicated and critical operations. A repetition of the Sicilian Vespers had also taken place at Verona, where every Frenchman found in the streets or houses was butchered in cold blood, and the commandant, General Balland, forced to retire into the castles with 3000 men. But when the armistice of Judenburg had recalled Laudon to the Tyrol, the Venetians, being thus abandoned to their own resources, were completely defeated by a corps of 15,000 men under Victor, and the insurgents everywhere dispersed. Napoleon now hastened to regain his communications, by re-entering the Venetian territory, and also to pour the full storm of his wrath on the devoted republic. The senate, in despair, made the most abject offers of submission; but it was too late. The archduke, on whose success they rested all their hopes, had shared the fate of Beaulieu, Wurmser, and Alvinzi; and Napoleon resolved that the Lion of St Mark should lick the dust. Besides, the acts of hostility committed by the senate of Venice were actually to him a piece of good fortune. At Leoben he had promised Austria compensation for the loss of Belgium and Lombardy; but he would have been much puzzled where to find the means of indemnification, if the Venetians had not furnished him with an occasion for disposing of part of their states. The price paid by the republic for its perfidy and cruelty was the surrender of large territories on the mainland, and five ships of war; the payment of three millions of francs in gold, and as much more in naval stores; and giving up twenty of the best pictures, along with five hundred manuscripts.[1]

After the occupation of Venice, and the dissolution of its oligarchical government, Napoleon established his headquarters at Passeriano, near Udine, where he awaited the arrival of the plenipotentiaries which the emperor was to send to treat of a definitive peace. In order to accelerate the progress of the negociations, he had, on the 24th of May, signed a preliminary convention with the Duke de Gallo; but the cabinet of Vienna having refused to ratify this act, he repaired to Milan to hasten the organization of the Cisalpine Republic, by annexing to it Modena, Reggio, Brescia, Bergamo, Ferrara, and Bologna, the whole destined to constitute a single state, with about three millions of inhabitants. He also profited by his stay at Milan to direct the democratic revolution, which overturned the oligarchy of Genoa, and placed all the friends of change in entire dependence on France; an event which was soon followed by the establishment of another mushroom state, under the name of the Ligurian Republic. Napoleon regarded Genoa as the most useful dependency which France could then procure to consolidate his work in Italy; and, as political propagandism was the order of the day, he appears to have judged correctly.[2]

In the meanwhile the negociations with Austria made no progress whatever. Scarcely had the preliminaries been signed when misunderstandings arose. The plotters of counter-revolutions had, by means of the elections, succeeded in forming a powerful party in the councils, at the head of which were Pichegru, Villot, and Imbert-Colomès; and a violent struggle was about to take place between the depositaries of the executive power and the legislative body, which last, far from seconding, sought to embarrass the operations of the government. These disorders revived the hopes of Austria. It was believed that some new crisis was approaching in France; the conspiracy of Babœuf encouraged this notion; the royalists corresponded with the exiled princes and the imperial government; the Directory held its power by an uncertain tenure, amidst so many elements of opposition; and every thing seemed to prognosticate that some important change was at hand. But the events of the 18th of Fructidor (4th of September 1797) destroyed all these illusions. The Utopian constitution of the year III. was dissolved; Pichegru and other royalists in the assemblies were arrested and sent into exile; Carnot and Barthélemy, who had opposed the majority of the Directory, were likewise banished; and the government for the moment recovered the semblance of security. Astonished at this sudden revolution, and conceiving that it could no longer calculate upon a royalist re-action, the cabinet of Vienna immediately despatched the Count de Cobentzel with full powers to treat; and henceforth the negociations proceeded in a fair train towards a definitive adjustment of differences. The result was the treaty of Campo-Formio, concluded on the 3d of October 1797, and so called from the village at which it was signed. By this act Austria yielded to France Belgium and the boundaries of the Rhine and the Alps, recognised the Cisalpine Republic, and received, as an indemnification for the loss of territory, Venice and her Italian provinces; whilst France assumed the sovereignty of Dalmatia and the Ionian Islands. This peace was glorious, and might have been solid, because, whilst France attained her natural limits, Austria had received ample compensation for the provinces which she ceded in virtue of the treaty. Peace having been thus concluded with Austria, it still remained to negociate with the princes of the empire; and for this purpose a congress of all the German powers was summoned to meet at Rastadt, whither Napoleon repaired as head of the French legation. But perceiving that the discussions would be protracted, he abandoned to his colleagues the conduct of the diplomatic business, and quitted Rastadt, after having provided, by a military convention, for the execution of the treaty of Campo-Formio, in as far as regarded the evacuation by the imperialists of Mayence and the other places on the Rhine.

Napoleon having thus terminated the most wonderful series of campaigns recorded in the history of war, set out for Paris, where he arrived in the beginning of December. The reception which he met with, on this occasion, was such as would have elated the most modest, and encouraged the least ambitious. It was easy to see that he might aspire to every thing in France. Nevertheless, the time had not yet arrived to profit by his fame, and take advantage of his popularity; it was necessary to wait until the Directory had completed its discredit with the country, and

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[1] Napoleon has been severely censured for his conduct to Venice, which some have represented as a species of felony; and Botta the historian, after mentioning with admiration the philippics of the priests who preached insurrection and recommended assassination, seems to think it very culpable in the French to have treated these persons as enemies. French blood had been treacherously shed; but for this, it seems, no reparation was due, no punishment exigible. In its last agony, the senate of Venice attempted to propitiate the conqueror, by offering him a purse of L.300,000. He rejected the offer with scorn, telling them that if they could offer him the treasures of Peru, the atonement would be insufficient. Yet he is represented as a monster, because he refused to huckster for the blood of his murdered soldiers; and it is thus that history is sometimes written.

[2] Cette fortresse immense, perchée sur des rocs contre lesquels il serait difficile de pousser les travaux reguliers d'une siège, pouvait être le clef de la Lombardie alors que le Piémont n'était pas à nous, et que la route du Simplons n'existait pas encore." (*Vie de Napoleon*, tom. i. p. 217.)

Napoleon. lost all hold of public opinion. France had indeed proclaimed him as its hero; but this was not enough, and to become the head of the state, it was necessary to be at the same time its deliverer and restorer. Whatever might be his claims to national gratitude, these could not give him a right to overturn the established government, to which he had been indebted for his rapid advancement and part of his glory;—it was essential that it should destroy itself by its incapacity, and by the disasters which it brought on France;—then only could he appear on the scene in the character of the deliverer of his country. And as he knew well with whom he had to do, he did not doubt that sooner or later this would occur; for, independently of the weakness of the individuals composing the Directory, he was convinced that the actual state of affairs could not endure long, and that, in any view, the fall of that body was inevitable. Still the part which he had in the meanwhile to play was sufficiently embarrassing. The pompous but empty title of general-in-chief of the army of England had indeed been conferred upon him; but at this time no preparations had been made for effecting a descent upon England; and all that could have been done would have been to throw twenty or thirty thousand men into Ireland, an enterprise which, however advantageous in itself, was by no means suited to his views. Napoleon, however, was too important a person to remain at Paris with his arms folded, a mere passive spectator of events.[1] For although the Directory had mingled its acclamations with those of all France, he knew that Rewbel and Merlin cherished secret enmity towards him, arising, no doubt, out of their fears; that they blamed the resolution which he had taken of concluding the peace of Campo-Formio without waiting for authority from the government; that they accused him of having treated with Austria, instead of marching to Vienna, which, according to these sages, would have revolutioned Germany, and afforded them the gratification of constructing some democratical republics out of the ruins of the holy Roman empire. These declamations were no doubt sufficiently absurd and revolting; but it was not the less necessary on that account to adopt some course, especially as the most opposite factions came daily to knock at his gate. An alternative presented itself, which was, either to conspire against the Directory, or to make common cause with it. He chose to do neither; and the only reasonable part which remained for him to take was to withdraw for a time, but to do it in such a manner as to fix attention upon himself, and by his achievements to keep his name in the mouths of the country. Napoleon.

During the negociations at Campo-Formio, Napoleon had suggested the idea of a descent upon Egypt, though he did not then think of undertaking it himself. The project had been relished by Talleyrand, who, after Fructidor, had replaced Charles Delacroix in the ministry of foreign relations. Napoleon now offered to carry it into execution. The results of such an enterprise might be immense, and this sufficed to render the task worthy of his talents and ambition. On the other hand, the majority of the Directors, to whom his presence gave umbrage, gladly entertained a proposition calculated to rid them of a pacificator whose popularity they dreaded. They were, in fact, enchanted to find him outrunning their wishes by a voluntary exile. Some statesmen, it is true, wished to retain him, representing that, by the force of circumstances, he would be called to take the helm of affairs. But he replied that the pear was not yet ripe, and that he was going to establish new claims to their confidence. Besides, the East presented a field of conquest and glory on which his imagination delighted to dwell. Europe he considered as but a mole-hill in comparison of Asia, whence "all the great glories" had come. And from the view which he took of the state of India at the time, he conceived, that in undertaking to open a direct communication with that country, he was taking the surest means to strike an effective blow at England. The expedition to Egypt had three objects: first, to establish on the Nile a French colony, which, without having recourse to the system of cultivation by slaves, should supply the produce of St Domingo and the sugar islands; secondly, to open new outlets for French manufactures in Africa, Arabia, and Syria, and to obtain, in return, all the productions of these countries; and, thirdly, setting out from Egypt as a base of operations, to carry an army of fifty thousand men to the Indus, and make common cause with the Mahrattas, the Hindus, the Mussulmans, and all the oppressed races of the Indian peninsula.

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[1] On his return to Paris, Napoleon took up his residence in the same small and modest house which he had occupied before his departure for Italy, in the Rue Chantereine, where he resumed his favourite studies and pursuits; contented, apparently, with the society of his friends, and carefully avoiding any act which might seem intended or calculated to invite popular notice or distinction. His society was much courted in the highest circles, and he occasionally received company at home; but pride as well as policy led him to shun notoriety, and shrink from being stared at in the streets or saloons as the wonder of the day. On one occasion, when greeted with some noisy demonstration of popular favour, "Bah," said he, "they would crowd as eagerly around me if I were on my way to the guillotine." At this period he was reserved and thoughtful, like one too much occupied with serious designs to take any pleasure in the elegant frivolities of fashionable conversation. Wherever he appeared he was the man of Lodi, of Arcole, and of Rivoli, disdaining to disguise his military bluntness in those brilliant circles where a man of an inferior stamp of character would have been ambitious to shine. Piqued by this haughty demeanour, Madame de Staël made various attempts to enlist him amongst the number of her votaries, but without success. "Whom," said she, one day addressing herself to the victorious soldier, "whom do you consider as the greatest of *women?*" insinuating a compliment, in expectation of an equivalent. "Her," replied Napoleon, dryly, "who has borne the greatest number of children." This keen retort was not forgotten, and the daughter of Necker became his declared enemy.

In the camp, as well as in the capital, he had maintained a similar reserve, especially with his officers. It has been said that his character changed with his elevation, and that, in proportion as fortune lavished on him her favours, his coldness and reserve increased. But this is evidently a mean and narrow view of his conduct. No great captain was ever more beloved by his officers, as well as by all who served under him; but to those who were immediately about him, he felt it necessary to observe a certain degree of dignity in his demeanour, in order to insure that ready, unquestioning obedience which is all-important in war. With the common soldiers, however, he often put himself on a footing of perfect familiarity. In the field, he disdained not to share the rations, or to drink from the canteen, of the sentinel; and the French private soldier, often as intelligent as those whom fortune has placed above him, used to accost the general-in-chief with more frankness than he would have ventured to display in addressing his own captain. In his despatches, and particularly in his conversations at St Helena, he often mentioned the pleasure he derived from his intercourse with the men, and at the same time gave many instances of their intelligence and observation. On one occasion, during his Italian campaigns, a common trooper addressed him, as he was riding past, and told the general that he thought he could suggest the movement which ought to be adopted. Napoleon listened to him, and heard him detail some operations which he had himself resolved on but a little before. In this way he won the hearts of the soldiers, and encouraged the display of talent and genius, which, throughout his whole career, he missed no opportunity of rewarding. No one perhaps ever possessed, in the same degree, the secret of calling forth, at his pleasure, all the energies, physical, mental, and moral, of those under his command, and of sustaining the courage and perseverance of his troops on occasions of the severest trial, where, under any other chief, defeat would have been inevitable.

Napoleon. The last was the grand and ultimate object aimed at. An army composed, one half of Europeans, and the other half of natives, transported by ten thousand horses and as many camels, carrying with them provisions for fifty or sixty days, water for five or six, and one hundred and fifty pieces of field artillery, with a double allowance of ammunition, might arrive in four months on the Indus, and in less than as many more decide the fate of India. The desert, he thought, would be no obstacle to any army provided with abundance of camels and dromedaries. Such an enterprise would give a high idea of the power of France; it would fix attention on its leader; it would surprise Europe by its boldness; and, if attended with success, it might be productive of mighty results. Such were the motives which appear to have actuated Napoleon in proposing an expedition which, from very different views indeed, was now determined on by the French government.

Egypt, it is true, was then a tributary of the Porte, one of the most ancient allies of France; but as the Mamlukes were the real masters of the country, and in open revolt against the Sultan, it was thought that the Divan, already occupied with the war against Paswan Oglou, pasha of Widin, and that against the Wahabees, and obliged, from weakness, to tolerate the independence of a number of refractory pashas, would not, for a mere shadow of sovereignty, throw itself blindly into the ranks of the enemy. The preparations were accordingly carried on with great activity, but with the utmost secrecy. All was under the direction of Napoleon, and his characteristic energy everywhere appeared. To draw the attention of England from the ports of the Mediterranean, he visited those of the Channel, and affected to occupy himself with the project of crossing it, when his thoughts were directed towards the invasion of Egypt. At length, all being ready, he repaired to Toulon on the 10th of May 1798, and, on the 19th, sailed from that port with thirteen ships of the line, six frigates, and a fleet of transports, having on board 25,000 men. He was joined at sea by the squadrons which had sailed from Bastia, Genoa, and Civita Vecchia, with from 7000 to 8000 men on board, destined to form part of the expedition; and on the 9th of June the whole arrived before Malta. The subsequent history of the expedition, until the return of Napoleon to France, is fully detailed under that head; and in the article Egypt will be found an account of the final conquest of that country by the British under Abercromby and Hutchinson. To these articles the reader is therefore referred for ample information respecting both branches of the subject. It is clear, indeed, that, after the destruction of the French fleet at Aboukir, all the chances of success were changed. It is no doubt true that Napoleon might still hope to maintain himself in possession of the country, provided he succeeded in attaching the inhabitants to his cause. But two serious obstacles presented themselves to the attainment of this object; namely, the maritime blockade, which obstructed all exportation; and the peculiar nature of the Mahommedan religion, which forbids all obedience or submission to an infidel power. Nor were these difficulties lessened by the failure of the attack on St Jean D'Acre, which, in proving that the invaders were not invincible, encouraged resistance and invited hostility.[1] The truth of this was soon exemplified by the landing of a Turkish army of 15,000 men in the peninsula of Aboukir, the fort of which they immediately stormed and carried, putting the garrison to the sword. But they paid dear for this momentary success. Napoleon pounced on them like an eagle on its prey, and, by one blow, annihilated a force which, if joined by the Mamlukes (who had re-appeared in Lower Egypt) and by the insurgents of the country, might have proved too formidable to be resisted with any prospect of success. This victory, gained on the 25th of July 1799, gave the more pleasure to Napoleon, that it served to wipe out the stain which the signal defeat sustained by the French fleet under Brueys had attached to the name of Aboukir. Napoleon.

The destruction of the Turkish army having consolidated the position of the French in Egypt, Napoleon decided on returning to France. Even when before St Jean d'Acre, he ascertained that a new coalition had been formed; and at a later period he received, through Sir Sidney Smith, several English journals, and the French gazette of Francfort, which informed him of the reverses sustained by the armies of Italy and the Rhine, as well as of the successive revolutions which had completed the disorganization and debasement of the Directory. The consummation which he had contemplated before leaving France seemed to have at length arrived; and no obstacle stood in the way to prevent his return to that country. A letter which he had received from the government announced that Admiral Bruix was to sail from Brest, in order to rally under his flag the Spanish squadrons and that of Toulon, and, having

[1] There are two points connected with this expedition, in regard to which it may be necessary to say a few words. These are, first, the massacre of Jaffa; and, secondly, the poisoning of the plague patients, at the same place, during the retreat from St Jean d'Acre to Egypt.

First, as to the massacre, it has been urged, that Jaffa having been taken by storm, the garrison might, in the heat of the assault, have been put to the sword. But, on that occasion, about two thousand men, the remains of the garrison, were made prisoners; and the question then arose, how they were to be disposed of. On the one hand, the French army was too weak to admit of detaching sufficient escorts to guard them. On the other, it would have been worse than imprudent to send away on parole men amongst whom the point of honour had no existence; and, besides, a part of the prisoners consisted of Janissaries, who, having been taken at El-Arish, had been liberated on a promise not to serve against the French during the war. In these circumstances Napoleon ordered them to be shot, and the whole perished in consequence. Judged according to the principles of the law of nations, this revolting butchery was wholly unjustifiable. At the same time, some allowance must be made for the circumstances in which he found himself placed. Situated as he was, the safety of his army appeared to him to constitute the supreme law; a supposed necessity alone rendered him cruel. Besides, had the case been reversed, these barbarians would have done the same thing; they would have put their prisoners to death, and gloried in sending their heads to Constantinople. These and other circumstances may in part account for and excuse, but can never justify, the deed; and it cannot be denied that it leaves a deep stain on his memory.

Next, as to the poisoning of the plague patients, this is a subject in regard to which the most extravagant exaggerations have been disseminated. The facts are few, and may be briefly stated. Having raised the siege of St Jean d'Acre in order to return to Egypt, he caused the hospitals containing the sick and the wounded to be evacuated, every means being put in requisition to transport them across the desert. But fifty, who had been seized with the plague, were not in a condition to be removed; they might have spread the pestilence in the army; and if abandoned to the ferocious Djezzar, they would certainly have been massacred. In these circumstances, Napoleon caused opium to be distributed to them, in order to give them death without suffering. He did wrong, and he confessed it. But that he was actuated by a sentiment of humanity, and did to these men what, in like circumstances, he would have wished done to himself, seems beyond doubt. This is proved by his conduct during the siege, as well as during the retreat. When the plague was raging in the army, and the name of this horrible scourge shook the nerves of Europeans; when the sick despaired utterly, and the healthy, filled with indescribable horror, trembled to minister to them in their misery; Napoleon went through the hospitals, breathed hope into the sufferers, rebuked the cowardice of their attendants, and with his own hands relieved the foul ulcers which no one dared to touch. On the retreat to Egypt, his attention to the sick was equally conspicuous. He issued an order that every horse should be given up for their service; and he himself marched on foot, exhibiting to the whole army an heroic example of endurance and compassion. That Napoleon judged wrong in regard to the plague patients, we, however, readily and fully admit. He should have left them to the mercy of the Turks, since such was the rigorous fate which their destiny reserved for them.

Napoleon. thus gained an ascendency in the Mediterranean, to bring back the army of Egypt, if circumstances rendered it necessary to do so. Napoleon was at the same time authorized to return to France. But Bruix had not appeared, nor was there any probability that he would, considering the force and vigilance of the British squadrons. What motive, then, could Napoleon have had to remain in Egypt? On the one hand, he felt himself capable of restoring to his adopted country the lustre of victory, and the benefits of internal and external peace. It was evident that the people were sick of the Revolution, and that the time had arrived for putting an end to it by securing the fruits of that mighty convulsion. On the other hand, all that remained to be done in Egypt was to colonize a conquered country, for which the principal dispositions had already been made; and Kléber was as capable of completing the enterprise as Napoleon, provided success were still possible. The latter conceived that he could be more serviceable to his country in Europe; and, besides, having resolved to return to France, the moment seemed propitious for carrying his design into effect. This proceeding has been made the subject of vehement declamation and virulent censure, but, as it appears to us, without a shadow of reason. At first Napoleon had received *carte blanche* from the Directory; next he had obtained express authority to return; and, in either case, it was perfectly competent for him to do so. But, not to rest altogether upon this, the expedition was either desperate, or it might still sustain itself. In the one case, all that remained to be done was to sign a convention of evacuation, which the humblest officer in the army could do as well as its chief. In the other, Kléber, who succeeded to the command, was capable of contending against all the enemies then existing in those countries, as he fully proved by his subsequent conduct, particularly by the victory he gained at Heliopolis.[1] In these circumstances, Napoleon, having left the chief command to this distinguished veteran, sailed from Alexandria on the 24th of August 1799, with a small squadron of four ships, and, after a passage full of marvellous escapes, landed at Fréjus on the 6th of October. His presence excited the enthusiasm of the people, and was considered by them as the certain pledge of victory. His progress to the capital had all the appearance of a triumphal procession, and, upon reaching Paris, he found that every thing was ripe for a great change in France.

The circumstances attending the revolution of the 18th of Brumaire (9th of November) have been narrated in the article FRANCE. That event was not produced, but only accelerated by the return of Napoleon. The necessity of a change in the existing order of things had, for some time, been generally felt and acknowledged. The constitution of the year III., with its preposterous anomalies, was universally detested, and the authorities which it had produced were deficient in capacity; but it was more easy to indicate the evils which it had produced than to suggest the remedies proper to be applied. At first view, the most simple and regular mode appeared to be, to confide to the legislative body the important task of modifying the constitutional compact. But, in adopting this system, there was reason to apprehend that the councils, eager to encroach on the executive power, would seek every opportunity to abridge it; whilst, on the other hand, if the initiative in these changes were intrusted to the executive authority, the danger became still more imminent that, on one pretence or another, the independence of the legislature would be destroyed, and the councils driven to commit an act of suicide similar to that which had decimated the legislative body on the 18th of Fructidor. Besides, what confidence could be inspired by any reform, the duration of which depended upon the caprice of magistrates whose powers and duties the constitution had so imperfectly fixed and defined? On the arrival of Napoleon, however, the difficulties which had presented themselves in a great measure disappeared, and the idea of reforming a bad system by means of itself was at once abandoned by all parties. The Directorial government having lost all hold on public opinion, and become equally feeble and contemptible, it seemed necessary to replace it by an imposing authority; and there is none so much so as that which is founded upon military glory. Napoleon perceived this in all its force. The Directory could only be replaced by him or by anarchy; and, in such a case, the choice of France could not for a moment be doubtful. Accordingly all parties now ranged themselves under two distinct banners: on the one side were the republicans, who opposed his elevation; and on the other all France, which demanded it. A *coup d'état* was nevertheless necessary to produce the revolution of the 18th of Brumaire; and this was effected by the employment of the troops, although without spilling a drop of blood. Napoleon had for a moment hoped that the projected change would be carried by acclamation. He was disappointed. But, after a short and noisy struggle, the republic, born amidst anarchy, and baptized in blood, expired in clamour and uproar, Siéyes assisting in the demolition of his own work; and the Directory was replaced by a provisional consulate, with Napoleon at its head. The dissolution of the councils was followed by the appointment of a legislative commission, and to a committee of this body was assigned the task of preparing a new constitution, which was afterwards denominated that of the year VIII.

Some of those who assisted in the revolution of Brumaire seem to have supposed that Napoleon, satisfied with the elevation he had attained, would not concern himself about civil affairs, and would leave in their hands a large share of the authority and patronage of the state. Great as had been the ability displayed by him in the field, they little expected that he would evince equal talents and aptitude for government. But these persons, amongst whom were Siéyes and Talleyrand, speedily discovered their mistake. At the very first meeting of the consuls, a lengthened discussion took place concerning the internal condition and foreign relations of France, and the measures not only of war, but of finance and diplomacy, which it either was or might be expedient to adopt. To the astonishment of Siéyes, Napoleon entered fully into all these subjects, showed perfect familiarity with them even in their minutest details, and suggested various resolutions which it was impossible not to approve. "Gentlemen," said Siéyes, on reaching his house, where Talleyrand and others awaited his arrival, "I perceive that you have found a master; one who can do and will do every thing himself." The Abbé was in the right. Napoleon had obtained the first place in the state; and it soon became evident, that whilst he fully understood the nature and duties of his position, he claimed the undivided exercise of the supreme authority. The mass of the nation confided in him, because it knew that the Revolution could have no better guarantee than his; that his elevation held out the prospect of victory abroad, and of a stable government at home, under which life and property would enjoy security; and that whilst he had no

[1] "Ce général, instruit, spirituel, vaillant, était un des plus beaux hommes de l'Europe. C'était l'idéal du dieu Mars; terrible dans les combats, calme et froid dans les combinaisons, grand administrateur, chéri du soldat, il ressemblait en tous points au Maréchal de Saxe. S'il n'eut pas l'occasion de se placer parmi les capitaines du premier rang, il avait l'étoffe pour le devenir; peut-être n'entendait il pas la stratégie dans toute l'étendue de ses combinaisons, mais il y fût parvenu par son génie et l'habitude de commandement." (*Vie de Napoleon*, &c. tom. i. p. 302.) But all these high expectations were cut short by the dagger of an Arab assassin, hired to revenge the defeat sustained by the Turks at Heliopolis.

Napoleon.

force except in placing himself at the head of the interests which the Revolution had created, he would employ every means to repress that anarchy under which the nation had so long groaned. Nor were these expectations disappointed. The work of reform proceeded rapidly and surely; order was everywhere established, and vigour infused into all the departments of the state. The situation of France, however, occasioned him some disquietude; and, notwithstanding the chances of success in his favour, he resolved to sue for peace, which he could then do in good faith, because the misfortunes of the preceding campaigns were not his work. But Pitt turned a deaf ear to the application, and never did statesman commit a greater fault; for that was perhaps the only moment at which the allies could with safety have concluded a peace, as France, in suing for it, virtually acknowledged herself vanquished. By this refusal, the English minister obliged Napoleon to enter upon that course of victory and conquest which ultimately extended his empire over the greater part of the Continent.[1]

War being thus inevitable, the First Consul issued a decree, dated the 7th of January 1800, ordaining the formation of an army of reserve, to consist partly of veterans, who were ordered to rejoin their respective corps, but principally of a new levy of 30,000 conscripts. At this time France had three armies on the frontiers, exclusively of the force under General Brune, which watched the partisans of the house of Orange in Holland. The army of Italy, reduced to 30,000 men, had taken refuge on the rocks of Genoa; 10,000 more guarded the Cottian Alps and Dauphiné; and the army of the Rhine, which reckoned above 100,000 combatants, was cantoned in Alsace and Switzerland, from Strasburg to Schaffhausen. In the presence of the superior forces which the enemy had assembled in the valley of the Po, the French durst not venture to repass the Alps; but it was nevertheless essential either to penetrate at once into Italy and Germany, or to strike such a decisive blow on the Danube, that the peninsula might there be reconquered by dictating peace to Austria in the heart of the hereditary states. In the one case, a double plan of operations would be necessary; in the other, Mantua, Alexandria, and Milan, were to be recovered at Vienna. Napoleon did not long hesitate as to the course to be adopted. He called out the conscripts; caused arms to be forged; appealed to the sentiment of national honour, which is never altogether dormant amongst the French; and assembled an army, young, it is true, but full of enthusiasm. The miserable state of the army of Italy has already been noticed; but that of the Rhine, when united to the army of Italy, presented a fine and formidable body of men, the command of which Napoleon intrusted to Moreau, at the same time sending him the recruits necessary to complete his different corps, and to put him in a condition to assume the offensive. The remainder of his disposable troops was directed on Dijon, where he organized an army of reserve, amounting to 40,000 men, which, from that central point, might be ready to march into Suabia, Switzerland, or Italy, according as circumstances should require. The nucleus of this army was formed by two fine divisions, originally drawn from that of General Brune, and which had just completed the subjugation of La Vendée.

Napoleon's first thought was to leave the army of Massena in defence on the Apennines, and to carry the army of reserve and that of the Rhine into the valley of the Danube. As the constitution of the year VIII. did not permit the consuls to command the army in person, his intention was to intrust that of the reserve to a lieutenant, and to leave the grand army to Moreau, but at the same time to accompany the head-quarters of the latter, and thence to direct the operations of both. This, however, was warmly opposed by Moreau, who refused to command under Napoleon if the latter should come to his army, and at the same time objected to the plan of operations which the First Consul had proposed.[2] Being not yet sufficiently strong to break with a man who had numerous partisans in the army, and who, had he possessed energy, might have occupied the first place in the state, Napoleon was obliged to yield; and, accordingly, leaving to his rival the command of the finest army which France had yet seen, with full power to direct it on the Danube in his own way, he then decided to conduct his conscripts by the St Gothard into Lombardy, ordering Lecourbe to second his operations as soon as Moreau should have developed his plan of campaign, and gained the first success. Finding, however, that the attention of Melas was exclusively fixed on Genoa, into which Massena, with the remains of his force, had been obliged to throw himself; and being anxious, if possible, to relieve that place, which was closely invested; he resolved to give the preference to the shorter route of the Great St Bernard, leaving that of the St Gothard to be followed by the corps which were on their march from the Rhine. In the beginning of May Napoleon set out for Dijon, and on the 8th he arrived at Geneva, where he made the necessary dispositions for effecting the passage of the Alps. The operations which followed have been pretty fully detailed in another place. (See the article FRANCE.) By a series of well-combined manœuvres and demonstrations, Napoleon deceived Melas as to his movements, descended like a torrent from the Alps upon his line of communications, and, by a single march, conquered Italy. Genoa had indeed surrendered; but the battle of Marengo, fought on the 14th of June, repaired every thing, and, by a victory snatched from the enemy, after he thought the fortune of the day decided, completed at one blow the conquest of Italy. Never as yet had Napoleon been in such imminent peril, not even at Arcole; never had genius and fortune more happily conspired to change the fate of battle. The victory was glorious, and its results were immense. A convention was entered into, by which Melas obtained permission to retire with his army behind the Mincio; and, in return, he consented to give up Coni, Alexandria, and Genoa, with the fort of Urbino, the citadels of Tortona, Milan, Turin, Pizzighetone, Piacenza, Ceva, and Savona, and the castle of Arona. The armistice of Alexandria was soon afterwards extended to the armies of Germany, and negociations ensued, which, however, in the end proved unsuccessful.

Meanwhile both parties continued their preparations for a renewal of the contest; and as all hopes of peace had entirely vanished, Napoleon resolved to put an end to the armistice in the middle of November, and, notwithstanding the severity of the season, to recommence hostilities.

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[1] The form of the refusal was somewhat extraordinary. Napoleon had addressed himself directly to the king of Great Britain, but his letter remained unanswered. The secretary of state for foreign affairs, however, transmitted a note to Talleyrand, in which he indicated the return of the Bourbons to France as the only means of putting an end to the troubles of Europe. It was, to say the least, curious to see a government which had twice treated at Lille, and recognised both the Republic and the Directory, refusing to treat with a more solid authority, sanctioned and supported by all France, and deposited in the hands of a man whom victory had illustrated.

[2] The plan proposed by Napoleon was, in a military point of view, preferable to that adopted by Moreau. He wished the latter to pass the Rhine at Schaffhausen, to take Kray in reverse, and to cut him off from Vienna, by driving him into the angle formed by the Mayn and the Rhine; in a word, to operate against the left of the Austrian general, as he himself did five years afterwards against the right of Mack at Donawerth. Had this plan been adopted, the French would have marched without difficulty on Austria, and would have reconquered Italy in Germany, perhaps at Vienna.

Napoleon. Moreau and Brune accordingly received orders to denounce the armistice, and between the 17th and the 27th all the French troops were put in motion. Leaving the army of the Rhine to the conduct of Moreau, Napoleon had conceived the daring project of attacking the Austrians under Bellegarde on the Mincio, by causing Macdonald, with the army of the Grisons, to clear the whole chain of the Rhætian Alps, in order to debouche upon Trent, and drive back the Austrians on the lagoons of Venice, at the same time that Brune assailed them in front. And this plan was, to a certain extent, executed. Macdonald effected the passage of the Splugen, at a time when the mere traveller dreads to expose himself amidst its snows, ice, and storms, with every customary precaution;[1] and Brune, being thus joined by the army of the Grisons, defeated the Austrians, and advanced to within a few miles of Venice. But these were, after all, only secondary operations. The fate of the contest was to be decided in Germany, where hostilities recommenced towards the end of November; and, in a few days afterwards, Moreau obtained a decisive victory at Hohenlinden. The battle was obstinate and bloody, but never for an instant doubtful; indeed it is one of the few instances to be met with in war where complete success was obtained by the literal execution of the plan previously devised by the general-in-chief. Moreau lost not a moment in taking measures to improve his success. The Austrians were vigorously pursued, and being driven from Salzburg, and other positions on the Inn, where they had endeavoured to make a stand, were forced to sue for an armistice, which was concluded at Steyer on the 23d of December; the cabinet of Vienna having consented to detach itself from England, and to treat for a separate peace. The operations of the army of Italy were also suspended, in consequence of an armistice which Brune had taken it upon him to conclude at Treviso; and, early in February 1801, a definitive treaty of peace was signed at Lunéville, by which France secured the boundaries of the Rhine and the Alps. This treaty, in fact, differed but little from that which, in 1797, Napoleon had concluded at Campo-Formio.

But amidst all these successes, the event of the 3d of Nivose (24th of December) convinced Napoleon that he was still upon a volcano. This conspiracy was unforeseen; indeed it was the only one which the police had not baffled beforehand. It took effect, because the conspirators had no confidants. The plan was simple, for it consisted in obstructing the progress of Napoleon's carriage as it passed along the Rue St Nicaise, and in the same instant exploding a machine crammed with all sorts of combustibles, and hence called *the infernal machine.* Napoleon escaped by a miracle; and the interest evinced by the people in his preservation amply indemnified him for the danger to which he had been exposed. The time had not been well chosen by the conspirators, for in France nothing was yet ready for the Bourbons. The assassins were tried, condemned, and executed, glorying in their design, and lamenting that it had not been successful.

The second coalition being thus dissolved, England alone maintained an attitude of hostility to France; but the progress of events soon developed a prospect of an accommodation. Pitt, sensible that the war had no longer any legitimate object, retired from the ministry; and his successor in office lost no time in renewing with M. Otto the negociations which had been broken off towards the close of 1800. The aspect of affairs had, in the interval, been completely changed. On the one hand, victory had again declared in favour of the French arms; Austria had been compelled to conclude a separate peace; Naples had been forced to receive the law of Foligno; an accommodation had taken place between the consular government and the court of Rome; the Emperor of Russia had thrown himself into the arms of France; and the new order of things established in that country had acquired a consistency which justified its formal recognition. On the other hand, England had obtained important advantages. The northern confederacy had been dissolved, or rather destroyed, by the victory of Copenhagen, followed, as it had been, by vigorous demonstrations against Russia; and the ultimate expulsion of the French from Egypt was no longer a matter of doubt. On both sides there existed the strongest motives for accommodation, because neither had apparently any thing more to gain by continuing the contest, and because each could now treat without any great sacrifice of honour or of dignity. Egypt and Malta were at first stumbling blocks in the way of an arrangement; but the conquest of the one led to an adjustment respecting the other; and at length, after a tedious negociation, preliminaries of peace were signed at London on the 1st of October 1801, and these were afterwards followed by a definitive treaty, which was concluded at Amiens on the 27th of March 1802. But the peace of Amiens, like that of Campo-Formio, proved merely an armistice. It was signed in the midst of mutual suspicion; and, before the ink was dry, difficulties arose, and from day to day accumulated the elements of a speedy and inevitable rupture. It is not our business here, however, to enter at all into these matters; and in what remains of this article we must confine ourselves exclusively to what is personal to Napoleon. Napoleon.

During this short cessation of arms, the attention of the First Consul was occupied with the re-establishment of religion, and the arrangement of a Concordat with the pope. The churches were deserted and in ruins; and, since the famous civil constitution of 1791, the clergy had been in a state of complete schism. His object was to restore the one and to reconcile the other, but without suffering them to acquire the power and influence they had formerly possessed; and, in pursuing it, he was actuated by the same motive which had led Henri IV. two centuries before to espouse the Catholic religion. His next measure was the establishment of a system of National Education, the necessity of which had been much felt ever since the universities and schools under the management of the clergy had been broken up amidst the first violence of the Revolution; and this was followed by the commencement of the great and difficult but highly important task of providing France with an uniform Code of Laws. Innumerable works of public utility were likewise begun. Roads and bridges were planned; museums were founded; and the vain were gratified with rising monuments of magnificence, whilst the reflecting recognised in every such display the depth and forecast of a genius formed for empire. This was more fully evinced in the measures by which Napoleon sought to secure the prolongation of his power. The establishment of the consulate for life, which was decreed on the 2d of August 1802, proved a grand step towards the completion of his design, and formed the primary base of the edifice which it yet remained for him to construct. This dignity

[1] When the project for effecting the passage of the Splugen was communicated to Macdonald, he declared the enterprise impracticable, and sent the head of his staff to state his objections, as well as to explain the inadequacy of his means. Napoleon listened attentively to the statement of this officer, and, after interrogating him on a variety of matters, and at the same time analysing the different hypotheses which the vast theatre of the Alps suggested for his combinations, he replied, "Je ne changerai rien à mes dispositions. Retournez promptement; je vais rompre l'armistice. *Dites à Macdonald qu'une armée passe toujours, et en tout saison, partout où deux hommes peuvent poser le pied.* Il faut que, quinze jours après la reprise des hostilités, l'armée des Grisons se trouve aux sources de l'Adda, de l'Oglio, et de l'Adige."

Napoleon. had already been prorogated for ten years by a senatus-consultum of the 6th of May; but on referring the matter to the people, it was decided that the consulate should be conferred upon him for life. He was now virtually sovereign of France. His task was to terminate the Revolution by giving to it a legal character, that it might be recognised and legitimated by the public law of Europe. But he knew, that before proposing to do so it was necessary to establish its principles, consolidate its legislation, and destroy its excesses. He believed himself strong enough to succeed in this, and he did not deceive himself. The principle of the Revolution was the extinction of Castes, not that of Ranks; it was the equality of Rights, not that of Classes; and by legislating in this spirit, Napoleon maintained all that was worth preserving. With the same view, and in accordance with the same principle, he instituted a new order of chivalry, called the Legion of Honour, which, if it served to further his scheme of empire, did not militate with that equality which alone he sought to maintain.

This is not the place for entering into any disquisition respecting the causes which so soon led to the rupture of the hollow truce of Amiens. Where a pretence is wanted for coming to blows, it will always be found. Napoleon insisted on the evacuation of Malta, in terms of the treaty, declaring that he would rather see the English encamped on the heights of Montmartre than see them in possession of that island. The British government, on the other hand, professing to discover, on the part of Napoleon, a desire to colonise Egypt, refused to give up Malta; and, after much diplomatic discussion, they presented an ultimatum, in which, as the French ministers had offered to subscribe any arrangement which might satisfy England on the subject of Egypt, they consented not to retain Malta as a possession, but only to reserve the right of occupying it for a period of ten years; at the same time stipulating that the French troops should evacuate Holland and Switzerland, and that an indemnity in Italy should be secured for the king of Sardinia. On these conditions they offered to recognise the king of Etruria and the Ligurian Republic. But, firm in his resolution not to deviate from the conditions of the treaty of Amiens, Napoleon rejected all these different articles, and nothing remained but again to have recourse to arms. On the 18th of May 1803, Great Britain declared war against France; and that fierce contest recommenced which, after an unexampled career of victory on the part of Napoleon, was destined to terminate in his downfall. His first measures were, the occupation of Naples and of Hanover; the one undertaken in the view of excluding English commerce from the ports of the south of Italy, and the other for the purpose of holding that hereditary possession until England should discover the necessity of fulfilling the article of the treaty of Amiens respecting the surrender of Malta. His next project was one of a far more daring and formidable character, namely, that of invading England, and thus striking a blow at the heart of his inveterate and implacable enemy. This operation, though difficult, he always regarded as practicable; the various chances he had carefully analysed and investigated; vast combinations were formed with a view to facilitate the descent; and enormous preparations were made for the purpose of carrying it into effect. During the years 1803 and 1804, the French coasts opposite England were covered with camps, in which troops to the amount of 160,000, mostly veterans, were assembled; considerable squadrons were prepared at Brest, Rochefort, and Toulon; and vast flotillas, intended to convey the troops across the Channel, were formed and exercised at various ports, particularly at Boulogne. On the other hand, the spirit of England was effectually roused, and immense preparations were made to repel the threatened invasion. The menaced descent rendered it necessary to organize a system of defence which entailed enormous burdens on the country, Napoleon. and this to Napoleon was so much gained.

But notwithstanding the vast extent of the means called forth for the defence of the country, the English ministry were not without serious apprehensions as to the result of the threatened invasion; and, to cause a diversion, they are said to have countenanced the unwarrantable warfare of plots and conspiracies. The projects of Pichegru, Georges Cadoudal, and others of the same stamp, are all well known, and have already been described in the article FRANCE. That assassination was contemplated by most of them, appears, from the evidence produced, to admit of no doubt whatever; indeed Cadoudal candidly and boldly admitted the fact, at the same time expressing his regret that the project had failed. This must be kept in view in order to judge fairly of what followed. Finding himself exposed to the attempts of desperadoes who aimed at his life, Napoleon resolved to deal a decisive blow, which he considered as indispensable, at once to strike terror into his enemies, and to fix the opinion of those millions of Frenchmen who had adhered to the Revolution, and combated in its defence. A distinguished Bourbon was at the gates of Strasburg; the police pretended to have discovered evidence which implicated him in the designs of those who had plotted against the life of the First Consul; and, under the first excitement produced by this information, the fatal command was issued to seize the prince and bring him to Paris. The order was promptly obeyed, and the Duke d'Enghien, having been seized at Ettenheim, in the territory of Baden, was carried to Paris, where, on his arrival, he was tried by a military commission, as an emigrant who had borne arms against France, condemned, and shot almost immediately after the sentence had been pronounced. This was the most unwarrantable occurrence in the life of Napoleon. Throughout the whole affair he seems to have been hurried on by a species of fatality, which blinded him to the true character of the proceeding, and prevented him from reflecting on the consequences of which it was certain to be productive. That he was misled by the infamous reports of the secret police, and by the perfidious suggestions of those around him, may perhaps be true; indeed there is good reason to believe that such was the case. He was likewise kept in ignorance of the afflicting circumstances which accompanied the catastrophe; and the appeal made to his clemency by the unfortunate prince was infamously withheld until after the sacrifice of the ill-fated victim had been consummated; but, with every allowance which can justly be made, it must nevertheless be admitted that, in commanding the seizure of the duke in a neutral territory, he became answerable for all the consequences which ensued, and that he had the double misfortune to incur the guilt of a public crime, and at the same time to commit a political error of the greatest magnitude.

The conspiracies intended to subvert the power of Napoleon, however, served only to confirm it; and the necessity of restoring to France an hereditary and stable government had now become equally obvious and urgent. An elective authority gives occasion to continual convulsions; it is contemptible even where it is connected with a legitimate dynasty, as in Poland and in the Germanic empire; and in a country situated like France it would have been the height of absurdity. A motion was accordingly made and carried in the Tribunate, that the imperial dignity should be conferred upon Napoleon; the legislative body without hesitation adopted the proposition; and a senatus-consultum appeared, in which he was declared Emperor of the French, with remainder to his male line, or, in the event of his having no children, to any son or grandson of his brothers whom he might chuse to adopt as his heir. This decree was sent down to the departments, and, on the 1st of December 1804, the prefects reported that

Napoleon. between three and four millions of citizens had subscribed their assent to the proposed measure; a result which certainly indicated the approbation of the French people. By the army the elevation of Napoleon was hailed with enthusiasm; and when he visited the camp at Boulogne, he was received with an excess of military devotion. His coronation took place at Paris on the 2d of December, amidst all that was most splendid and illustrious in that capital. The ceremony was performed in the cathedral of Nôtre-Dame, where the pope officiated on the occasion, and consecrated the diadems, which Napoleon placed on his own head and on that of the Empress Josephine. In like manner, on the 25th of May 1805, he placed on his head the iron crown of the Lombard kings, in their ancient capital, and henceforth styled himself Emperor of the French and King of Italy; announcing, however, that the two crowns should not be held by the same person after his death. Never was any revolution so easily effected as that which overturned the French republic, in defence of which so much blood had been shed. And the reason is plain; the substance of all that had been fought for was maintained; the name only was changed.

The history of the wars of the empire belongs to that of France, Spain, Austria, Prussia, and Russia, to which the reader is accordingly referred. To give details of these various contests would fill many volumes, and even the most meagre abridgment would occupy a space far exceeding the limits prescribed to this article. The Emperor Napoleon again made an offer of peace, which was rejected, and a new coalition, being the third, was formed against France. The ostensible objects of this league were to restore the independence of Holland and Switzerland, to free the north of Germany from the presence of the French troops, to deliver Piedmont, and to compel the evacuation of Italy; but its grand aim and design, in as far as concerned England, was to find employment for the French troops on the Continent, and to avert, for a time at least, the dangers of a threatened invasion. The hopes of the allies were, however, speedily crushed by the decisive victories of Ulm and Austerlitz; and Napoleon would soon have been at liberty to turn his arms against England, had it not been for two events, one of which served in a great measure to counterbalance his successes in Germany. We allude to the battle of Trafalgar, in which, on the 21st of October 1805, the very day after Mack surrendered at Ulm, the French grand fleet was annihilated by one mighty blow, and the means of effecting a descent on England completely destroyed. The other event above referred to was the declaration of war by Prussia, after Austria had been crippled and forced to receive the law from the conqueror, and whilst the Russian army was still behind the Vistula. This rash and headlong conduct was dearly expiated at Iena and Auerstadt, and the dismemberment of the Prussian monarchy formed a just retribution for the double perfidy and presumptuous confidence of the cabinet of Berlin. The campaign of 1807, after a prodigious effusion of blood, terminated with the battle of Friedland; and the peace of Tilsit, which followed, not only confirmed the humiliation of Prussia, but appeared to throw Russia into the arms of France. The French emperor had already made a gigantic stride towards the establishment of an European monarchy, and the effectual exclusion of English commerce from the ports of the Continent, by which means he vainly hoped eventually to reduce Great Britain to the necessity of listening to terms of accommodation.

In prosecution of this system, which ultimately proved Napoleon. the main instrument of his ruin, when, to all human appearance, it seemed about to be crowned with success, Napoleon commenced his aggressions on Portugal and Spain, and thus entangled himself in a struggle which, like a festering ulcer, continued to gnaw at the vitals of his power, and became the proximate cause of his ultimate overthrow. In vain did he bring all his means to bear upon this unhappy contest; in vain did he drive the English under Sir John Moore out of Spain. If permitted to finish his task, the subjugation of the Peninsula could not have been long deferred; but the formation of a fourth coalition again called him away into Germany, where Austria, scarcely dissembling her aversion to the continental system, was actively preparing to take up arms, in the hope of recovering what she had lost, and freeing herself from the yoke of France. The attempt, however, proved unsuccessful; and though accident gave her a temporary advantage at Aspern, the battle of Wagram placed her once more at the feet of the conqueror. At this moment the power of Napoleon seemed irresistible. No enemy opposed him on the Continent except the insurgents in Spain, aided by the English; and had he instantly directed his whole energies to terminate the war in the Peninsula, it is probable that his power would have remained unshaken by any reverse likely to befall him. But he judged otherwise; and, in seeking to attach Austria to his interests by a marriage with a princess of the imperial family, he became involved in a system of policy, the ultimate term of which was the abdication of 1814. From this moment his ascending movement was stopped; he had reached the culminating point of his greatness; and though his genius had as yet lost nothing of its vigour, his power began to decline.

The events of 1810 and 1811 belong chiefly to the history of Spain, where the impassible system of Wellington was gradually but steadily breaking down all opposition, and maturing a resistance which every day became more formidable. Those of 1812 were fraught with the destiny of Napoleon. He had long regarded a war with Russia as inevitable. The co-existence of two such empires as those of France and Russia seemed to him incompatible; and differences speedily arose which prognosticated a terrible collision. The preparations on both sides were immense; the fate of Europe, or rather of the empire of the world, was about to be decided in a single campaign; but Napoleon contemplated the conflict without dread, because, in his view, it afforded the only means of terminating for ever the long struggle which had consumed his life. Russia was too strong ever to enter voluntarily into the European system, such as Napoleon wished to reconstruct it, with France as its pivot; but the development of that system he considered as indispensable to his own safety, not to mention the stability of his power; and hence war seemed to him to be inevitable. Russia, on the other hand, resolved sternly to abide the terrible onset, and to trust to her cause, her climate, and her arms. The result is known to all. Amidst the frozen steppes of the Scythian wilderness perished those invincible legions which had carried the imperial eagles in triumph to Vienna, to Berlin, to Warsaw, and to Moscow. No such catastrophe had ever been witnessed in modern times; all preceding examples of suffering and disaster in war sank into nothing in comparison with it.[1] Yet Napoleon, undismayed by the magnitude of the calamity, displayed the almost miraculous resources of his genius in repairing the losses he had sustained; and his appearance in Ger-

[1] The causes which led to the disastrous termination of Napoleon's Russian campaign appear to have been various. 1. The necessity of advancing beyond Smolensko in the first campaign, a necessity imposed by circumstances which only left to Napoleon the choice of proceeding further or retracing his steps. 2. The circumstance of no decisive battle having taken place between Wilna and the Dwina, within which limits a repetition of Austerlitz or of Friedland would have placed Europe at his feet. 3. The imbecile conduct of Jerome, in not destroying Bagration after he had been cut off by the movements of Napoleon. 4. The indifference of the Poles of

Napoleon. many early in 1813, at the head of a powerful army, is perhaps the most astonishing circumstance in his extraordinary career. But fortune had now completely changed sides. Victorious at Lutzen, at Bautzen, and at Dresden, he was, through the treachery of his allies, and the faults of his lieutenants, defeated at Leipzig, and forced to retreat beyond the Rhine. Still he maintained the struggle with incomparable energy and perseverance; and never did his transcendent genius for war display itself more resplendently than in the astonishing campaign of 1814, when, by incredible efforts, he struggled, though in vain, to expel the invaders from the territory of France. But the battle of Montmartre, followed by the capitulation of Paris, decided the fate of the campaign, and with it that of Napoleon. He might indeed have retired behind the Loire, and there rallied under his banners Soult, Suchet, and Augereau, with a mass of from 120,000 to 130,000 men; but the marshals were tired of war, the spirit of the nation had sunk under its misfortunes, the people demanded that a term should be put to their sufferings, and Napoleon himself shrunk from entailing upon France the still greater calamities of a civil war. In these circumstances, he resolved to abdicate, and, on the 18th of April, signed an instrument by which he renounced for himself and his heirs the thrones both of France and of Italy.

The allies having left Napoleon the choice of his retreat, he chose the island of Elba, near to Corsica, where he was born, and close to Italy, the first theatre of his glory; and set out, accompanied by four commissioners, one from each of the great allied powers. He was allowed to retain the title of Emperor, and to take along with him a small number of those veteran soldiers who had accompanied him in so many dangers, and whose attachment was not shaken by his misfortunes. In traversing France on his way to the place of his exile, he had occasion to observe the extreme divergence of opinion respecting himself; for in proportion as he was beloved and regretted in the environs of Paris and the provinces of the east, he was detested in those of the south, where even the respect due to misfortune was denied him; and he was more than once obliged to put himself under the protection of the stranger, to defend his life against the people who had been so often intoxicated with his triumphs. On the 4th of May he landed in Elba, wherein, being separated from his wife and son, and without any projects for the future, he seemed to regard himself as politically dead to Europe, with no other task remaining for him to perform but that of writing the history of the rise and fall of his power.

Napoleon. But the march of events advanced so rapidly, that he was surprised by them even in his retreat. He perceived that Louis XVIII. had not discovered the secret of his age; he was convinced that the majority of France desired to secure the results of the Revolution; and he knew that this majority would ultimately dictate the law. Louis XVIII. had no doubt granted a charter, which was excellent in itself, as all charters are when taken by themselves; but such acts are valuable only with reference to the authority charged with defending them; and in France the king was not so much the head of the state, as the head of a party which regarded the charter with aversion, as a concession to the revolutionary principle, and hoped to destroy it piecemeal, according as opportunities offered for doing so. Napoleon anxiously watched the progress of events, which outrun his expectations; he was also well informed as to what passed at the congress of Vienna; and having learned in time that the ministers of Louis XVIII. had proposed to the congress to remove him from Elba, in order to send him in exile to St Helena, he conceived a project which will appear audacious in history, but which, in reality, circumstances indicated as the only reasonable course to be followed. He resolved to return to France.

His preparations were not long; he brought nothing with him but arms, and trusted that France would provide the rest. After a passage of five days, he landed without opposition at Cannes, near the spot where, fifteen years before, he had disembarked on his return from Egypt. This memorable event took place on the 1st of March 1815. He had no determinate plan, because he wanted particular data as to the state of affairs; his intention was to be guided by events, making provision only for probable contingencies. Nor was he at all embarrassed as to the route he should take; for he required a point of support, and as Grenoble was the nearest fortress, he lost no time in directing his march on that place, which opened its gates to receive him. The enthusiasm of the troops knew no bounds, and the reception which he everywhere met with confirmed him in his project. In fact, his march to Paris was throughout a triumphal procession. In twenty days this new revolution was terminated without having cost a single drop of blood. Amidst the acclamations of all France, Napoleon was reinstated on the throne. The grandeur of his enterprise had effaced the recollection of his misfortunes; it had restored to him the confidence of the French people; and he was once more the man of their choice.

Napoleon had refused the peace which was offered him at Châtillon, because he was then on the throne of France,

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Volhynia and Podolia, who did not second Napoleon's projects with the ardour he expected, though it was undoubtedly their interest to aid him by every means in their power. 5. The total want of resources in Lithuania, occasioned partly by the deficient harvest of the preceding year, and partly by the contributions levied to fill the Russian magazines. 6. The distance of the French magazines established at Königsberg, which were twenty-five marches in the rear, so that it required fifty days for a convoy to go and return, a circumstance which prevented the possibility of regular distributions. 7. The inexplicable delay at Wilna, where Napoleon remained fifteen days inactive, instead of pushing at once on Glubokoë and Polotsk, or falling upon Bagration at Minsk, either of which would have led to important results, though the false direction given to the principal Russian army on Drissa pointed it out as the main object of attack. 8. The inefficient conduct of Murat, in command of the van-guard, who, with thirty thousand horse, failed to make any serious impression on the enemy during their retreat. 9. The tactical error committed at Borodino, in crowding the troops into masses; a circumstance which prevented the extreme left of the Russians from being assailed with sufficient vigour by the old Smolensko road, where success would, in all probability, have been decisive. 10. The discontinuing the pursuit of the Russian army on its departure from Moscow, when it was much weakened in numbers, and greatly shattered by the dreadful conflict in which it had recently been engaged. 11. Want of knowledge of the country, the existing maps of which were detestable, and often served to mislead, whilst no accurate information could be obtained from the inhabitants. 12. The peace with Turkey, and the alliance of Bernadotte with the Russians, which altered all the chances, by giving two armies more to the enemy. 13. The progress made by the Russians in the art of war, which was particularly evinced in the conduct of the retreat from Drissa, and subsequently in the movement which united the different masses of the Russian troops on the Berezina, one of the most remarkable military operations of the age. 14. The capital fault committed by Napoleon, in not uniting under one vigorous and able chief the corps of Macdonald, Oudinot, St Cyr, and Victor, and in leaving, disseminated on the Dwina, 100,000 men, who, if united, would have destroyed Wittgenstein, and rendered his position secure. 15. And, lastly, the great efforts made by the Russian nation, and the resolute character displayed by the Emperor Alexander. Such appear to us to have been the principal causes which led to the disastrous termination of Napoleon's Russian campaign. The whole calamity has usually been attributed to the cold; but this was so far from being the primary cause of failure, that it continued to be very supportable till the arrival of the French on the Berezina, where, out of 300,000 men whom Napoleon had either moved on the Dwina or carried to Moscow, not more than 50,000 remained in a condition to fight.

Napoleon. and the terms proposed would have made him descend too much; but he could accept that which had been granted to the Bourbons, because he had just returned from Elba, and because one at the head of a great movement may stop short when ascending, but never when descending. Peace, however, was denied on any terms. It was declared by the Congress of Vienna, in a proclamation published by them to all Europe, that Napoleon, "by appearing again in France, had deprived himself of the protection of the law, and manifested to the world that there could neither be peace nor truce with him." Nothing remained, therefore, but to commit the future destiny of Europe to the arbitrement of arms. The most active preparations were accordingly made on both sides; by Napoleon, to repel the threatened aggression; and by the allies, to overturn the government which had been so suddenly reconstituted in France. Various attempts were made to open a negociation with the allies, but all proved abortive; and as Napoleon had no intention to await the onset of his enemies, he resolved to fall upon the Anglo-Prussians, before the troops of Austria or Russia could be in a condition to take part in the conflict. By the end of May he had about 180,000 ready to take the field, and by the middle of July this number would have been increased to 300,000; but by transporting the seat of war into Belgium, he would save France from invasion, draw on the enemy six weeks sooner than he would have come of his own accord, and perhaps also take him unprepared. These considerations decided him to become the assailant. On the 12th of June he set out from Paris, and on the 14th he established his head-quarters at Beaumont, where, in order to profit by the dissemination of the enemy, he judged it necessary to open the campaign without a moment's delay.

Accordingly, he passed the frontier of Belgium on the 15th, and on the following day advanced to Fleurus, where he discovered the Prussian army ranged in order of battle between St Amand and Sombref. Ney had received orders to push forward with 42,000 men by the Brussels road as far as Quatre Bras, an important point situated at the intersection of the roads leading to Brussels, Neville, Charleroi, and Namur, and there to keep the English in check, and prevent them from advancing to the aid of the Prussians, whom Napoleon proposed to attack with the 72,000 men that remained under his command. The battle of Ligny followed, in which the Prussians were defeated; and so complete was the rout, that, of 70,000 men, their generals were never afterwards able to assemble more than about 30,000. A night pursuit would have annihilated them. But Ney had been much less fortunate at Quatre Bras, where he displayed great infirmity, neither bringing his whole force to bear on the English, nor throwing himself back on Bry to act on the rear of the Prussians. The Prussian army being thus defeated, Grouchy was detached in pursuit of it with 35,000 men, whilst Napoleon proceeded to turn his efforts against Wellington. We have no space to detail the operations which followed, nor even to describe that fierce conflict which decided the fate of Napoleon, and with it that of Europe. The result, more fatal to France than that of either Agincourt or Poictiers, is known to every one. By the timely arrival of the Prussians, who had given the slip to Grouchy, and their junction with the English, the French army was not only defeated, but totally dispersed. In the conduct of the battle Napoleon certainly committed faults, particularly in forming his troops into too deep masses, and also in employing his cavalry too early in the action; but these sink into nothing compared with the gross blunders of his lieutenants, by which both the French army and himself were utterly undone.

He returned to Paris, in the hope that the national spirit might be roused, and that all good Frenchmen would unite in defending their country against another foreign invasion. But he soon found that he had deceived himself. Misfortune had deprived him of all consideration; he experienced opposition where he least expected it; the chambers rose in a state of insurrection against him; and, in a short time, he was compelled to sign a second abdication. He then decided to retire to America, and at first proposed to embark at Bordeaux, where his brother Joseph had hired a merchant-vessel for the purpose. But he afterwards changed his purpose, and set out for Rochefort, where he arrived on the 3d of July. Finding it impossible, however, to put to sea, and nearly equally perilous to return to the interior, he took the resolution of throwing himself upon the generosity of the prince regent of England; and, on the 15th, embarked on board of the Bellerophon, in Aix roads. It is universally known in what manner this appeal was answered. By a formal decision of the English government, he was sent *as a prisoner of war* to St Helena, where he pined away in hopeless exile, until death put an end to his misery on the 3d of May 1821. In his will he had expressed a desire that his body should be conveyed to France and buried on the banks of the Seine, "amongst the French people, whom he had loved so well;" but this request could not, it seems, be complied with; and he was interred in a spot near Longwood, the place of his residence in the island, where a huge block of stone uncarved with a name covers the remains of him who needs no epitaph. Napoleon

Posterity will judge of the treatment which Napoleon experienced at the hands of England. A prisoner in another hemisphere, he laboured to defend the reputation which he knew history was preparing for him, and which various parties exaggerated or blackened, according to the dictates of their respective prejudices or passions. But death surprised him at the moment when he was putting his commentaries into shape, and he consequently left them imperfect. They contain much, however, that is not only valuable in itself, but calculated to dispel prejudice, and to throw light upon some of the most important events in his life; and no one can read them attentively without experiencing a feeling of respect and sympathy, mixed with admiration. No man, perhaps, was ever made the object of such unsparing abuse, such bitter detraction, such inveterate and unrelenting rancour; but it is already certain, that neither envy, nor malice, nor hatred, nor slander, will ultimately succeed in depriving him of his just fame. By his victories of Montenotte, Castiglione, Rivoli, the Pyramids, Marengo, Ulm, Austerlitz, Iena, Friedland, Abensberg, Ratisbon, Wagram, Dresden, Champaubert, Montmirail, and Ligny, he acquired enough of glory to efface the single disaster of Waterloo; and his five codes embody a system of jurisprudence, in the formation of which he had a principal share, and which has not only proved a boon of inestimable value to France, but is even at this day received as authoritative in a great portion of Europe; thus justifying his own proud anticipation, that he would go down to posterity with the codes in his hand. The monuments which he has left in France and in Italy will also attest his grandeur to the most remote ages; and though he can never be freed from the reproach of ambition, yet, in extenuation of this "glorious fault," he might say, like Mahommed,

> Je fus ambitieux.....
> Mais jamais roi, pontife, ou chef ou citoyen,
> Ne conçut un projet aussi grand que le mien. (A.)

Napoleon's Land || Narain-gunge.

NAPOLEON'S LAND, a tract of land on the southern coast of New Holland, which extends about fifty leagues, from long. 138. 58. to 140. 10. E., and from lat. 35. 40. to 37. 36. S., in the course of which there is no river nor inlet. It was discovered by Captain Baudin in the year 1802. The French, who also sent a squadron of discovery to the coast of New Holland, comprehend under this title a much larger extent of coast, commencing at about 110. E. long. and stretching from 33. to 39. S. lat., including the whole coast from Cape Leeuwin on the west, to Wilson's Promontory on the south. Part of this was, however, previously explored by the expedition under Captain Flinders.

NAPOLI DI ROMANIA, a city of the Morea. It is situated near the upper end of the fine gulf of Napoli, at the distance of seven leagues from the north-west end of the island of Pezza, or Spezzia. The gulf is irregularly formed, and has in it several islands. It was at one period the seat of the Greek government, having been taken from the Turks in December 1822.

It is a place well situated both for defence and for commerce; it has an excellent and secure harbour, and has been sometimes described as the Gibraltar of the Archipelago; but it is not at present in the best state of defence. Before 1821, this place was the dépôt of almost the whole of the exportable produce of Greece, and it carried on a most extensive commerce in sponges, silk, oil, wax, and wines. At present it has not recovered from the effect of the war which so long desolated the country. Though the first appearance is striking, from its position at the foot of a gigantic and abrupt promontory, with impregnable castles on its summits; yet, on entering, the narrow streets, the meanly built houses, the humid air impregnated with fœtid odours, and the general filthiness, are most disgusting to every new comer. This condition of the place has produced epidemic fevers, which at various periods have swept away a large portion of the population. The number of inhabitants is very fluctuating, and no very accurate statements are attainable. They have been recently estimated at from 14,000 to 20,000; but if even the smaller number be correct, it must be the most populous place of its size of any city in Europe, for the houses are so small that in every room there must be four or five persons. The manners of the people are still purely eastern, few of the females, except the very poorest, being to be seen out of their dwellings.

NAPPAH, a town of Hindustan, in the province of Gujerat, thirty miles east by north from Cambay. Long. 73. 15. E. Lat. 22. 27. N.

NARAINGUNGE, a considerable trading town of Bengal, in the district of Dacca, pleasantly situated on the western branch of the river Brahmapootra, denominated the Luckia. It is a place of great trade and industry; its principal commodities being grain, salt, tobacco, and lime. A considerable quantity of fine muslin is also manufactured here; and a scene of activity is exhibited in this place which is very seldom seen in a community purely Hindu. During the rainy season the greater part of the country is inundated. There are still many remains of ill-constructed fortresses, which were raised in this vicinity in the seventeenth century, to protect the country against the Mughs or Arracauners, who at that time made inroads into Bengal with their war-boats, and not only pillaged whole villages, but also carried away the inhabitants and sold them for slaves. On the opposite side of the river is a noted place of Mahommedan pilgrimage called Cuddumresoul, where is shown the impression made by the prophet's foot on a stone; it is much reverenced by the pious Mahommedans, who resort to it in great numbers from Dacca and the adjacent villages. The inhabitants amount to 15,000. The principal merchants are not natives of the town, but come from different districts, and bring their families along with them. Long. 90. 35. E. Lat. 23. 37. N.

Narain-gur || Narikee.

NARAINGUR, a town of Bengal, in the province of Orissa, and district of Midnapoor. It was formerly surrounded by a thick wood, defended by batteries at the entrances; but during the contests between the Afghans and the Moguls such defences were found available against the incursions of cavalry. It is sixty-six miles south-west from Calcutta. Long. 87. 35. E. Lat. 22. 11. N.

NARANGABAD, a town of Hindustan, in the territories of the nabob of Oude, seventy miles north-north-west from Lucknow. Long. 80. 30. E. Lat. 27. 45. N.

NARANJOS, a cluster of small islands amongst the Philippines, twelve miles north-east of Masbate. Long. 123. 54. E. Lat. 12. 29. N.

NARASINGHAPOOR, a town of the south of India, in the province of Mysore, situated on the banks of the Cavery, immediately below its junction with the Capini. It contains about 300 houses, and the surrounding country is productive. The only ferry-boats here are what are called donies, which are circular baskets, eight or ten feet in diameter, and covered with leather, in which the inhabitants cross the river. Long. 77. 5. E. Lat. 12. 8. N.

NARBERTH, a town of South Wales, in the hundred of its own name, in Pembrokeshire, 254 miles from London. It is situated on a hill, contains two townships, and has a market, which is held on Wednesday. The population amounted in 1801 to 1531, in 1811 to 1779, in 1821 to 2395, and in 1831 to 2589.

NARBONNE, an arrondissement of the department of the Aude, in France, 610 square miles in extent. It is divided into six cantons, and these into seventy communes, containing 51,200 inhabitants. The capital is the city of the same name, which is the seat of an archbishop. It is situated in a deep valley, surrounded with mountains, out of which the river Aude issues, and by a canal it is connected with the Mediterranean Sea. This canal, constructed by the Romans, divides the city into two parts. The cathedral is a fine object, with a magnificent portal leading to it. It contains 2100 houses, and 10,500 inhabitants, who make woollen cloths, and trade largely in wine, oil, honey, silk, and other productions of the soil. It was a city of much importance under the Romans; and many inscriptions of that age are still found. Long. 2. 54. E. Lat. 43. 10. N.

NARCISSUS, in fabulous history, the son of the river Cephisus, and of Liriope the daughter of Oceanus. He was a youth of great beauty; and Tiresias foretold that he would live until he should see himself. He despised all the nymphs of the country, and made Echo languish till she became a mere sound, by refusing to return her passion; but one day returning weary and fatigued from the chase, he stopped on the bank of a fountain to quench his thirst, and, seeing his own form in the water, became so much in love with the shadowy image, that he languished till he died. The gods, being moved by his fate, changed him into the flower which bears his name.

NARCONDAM, a small uninhabited island in the Bay of Bengal, but so high that its peak may be seen at a great distance, and, in fact, serves as a land-mark. It is twenty-seven leagues to the eastward of the Great Andaman, and is covered with wood. Long. 94. 12. E. Lat. 13. 25. N.

NARIAD, a town of Hindustan, in the province of Gujerat, formerly belonging to the Guicowar Mahratta chief. This town, with the adjoining district, was ceded by the Guicowar to the British in 1803, in part payment of the subsidiary force; and at that time the territory was estimated at 175,000 rupees. It is twenty-five miles north-north-east from Cambay. Long. 72. 59. E. Lat. 22. 42. N.

NARIKEE, a town of Hindustan, situated in the province of Agra. It is twenty-eight miles east-north-

Narlah ‖ Narses

east from the city of Agra. Long. 78. 20. E. Lat. 27. 18. N.

NARLAH, a town of Hindustan, in the province of Orissa, possessed by independent native chiefs. It is thirty miles east from the town of Bustar. Long. 83. 5. E. Lat. 19. 50. N.

NARNALLAH, a town and fortress of Hindustan, in the province of Berar, belonging to the rajah of Nagpoor. It is a place of considerable strength, being built of stone, and situated upon the top of a mountain. Long. 77. 30. E. Lat. 21. 40. N.

NARNOUL, a town and district of Hindustan, in the province of Agra, being situated principally between the 28th and 29th degrees of north latitude. It belongs to several independent chiefs. The principal towns are Narnoul and Rewary. Narnoul, the capital, and the residence of an independent chief, is situated in long. 76. 8. E. and lat. 28. 4. N.

NARNI, a city of Italy, in the delegation of Spoleto, in the ecclesiastical territory. It is beautifully situated on the side of a hill, at the foot of which the river Nera runs through a valley of great fertility, producing abundance of figs, raisins, and currants. The town is neat, but not well peopled, the inhabitants not much exceeding 5000, though it is the see of a bishop, and has a cathedral, five parish churches, seven monasteries, and five nunneries. Here are the remains of an aqueduct, which furnishes spring water to the city. It was built by the Emperor Augustus, and is a prodigious pile of masonry. Long. 12. 16. 15. E. Lat. 42. 31. N.

NARO, a city of Sicily, in the province of Mazzara, about seventy-five miles from Palermo. It stands on a height at the mouth of the small river of its own name, known to the ancients as the Hypsa. Articles of commerce from this place are shipped at the mole of Girgenti, a work constructed with large blocks of marine exuviæ, consisting almost wholly of petrified shells, which were brought from the ruins of the temple of Jupiter Olympius in the year 1756. There is here a presidio for criminals condemned to hard labour, who work chiefly in clearing the harbour of the deposits occasioned by the southerly winds. This place is remarkable from the peculiar properties of its granaries, which consist of large conical cisterns or reservoirs excavated in a calcareous rock, and entirely free from the effects of humidity, so that the corn can be kept twenty years without injury. No charge is made for thus housing the corn, but when it is exported the government derives some benefit. Naro contains about 10,000 inhabitants, and is esteemed a healthy place.

NARRATION, in oratory, poetry, and history, a recital or rehearsal of facts as they occurred, or as it is supposed they occurred. Lord Kames, in his Elements of Criticism, has detailed and illustrated, at great length, the rules and directions which appeared to him necessary to be observed in the use of narration; and, in other works of a similar description, the same subject is also treated of, with greater or less minuteness, according to the particular objects which the authors had in view.

NARSES, an eunuch, who emerged from obscurity, and rivalled Belisarius in heroism, under the reign of the Emperor Justinian. From the domestic service of the palace, and the administration of the private revenue, he was suddenly advanced to the head of an army; and he is ranked amongst the few eunuchs who have rescued what Lord Byron contemptuously calls "the third sex" from the contempt and hatred of mankind. A feeble diminutive body concealed the soul of a statesman and a warrior. His youth had been employed in the management of the loom and the distaff, in the cares of the household, and in the service of female luxury; but, whilst his hands were busy, he secretly exercised the faculties of a vigorous and a discerning mind. A stranger to the schools and the camp, he made it his study in the palace to dissemble, to flatter, and to persuade; and as soon as he approached the person of the emperor, Justinian listened with surprise and pleasure to the manly counsels of his chamberlain and private treasurer. The talents of Narses were tried and improved in frequent embassies. He also led an army into Italy, acquired a practical knowledge of the war and the country, and presumed to rival the genius of Belisarius. Twelve years after his return, the eunuch was selected to achieve the conquest which had been left imperfect by the first of the Roman generals. Instead of being dazzled by vanity or ambition, he seriously declared, that unless he were provided with an adequate force, he would never consent to risk his own glory and that of his sovereign. Justinian granted to the favourite what he might have denied to the hero; the Gothic war was rekindled from its ashes; and the preparations were not unworthy of the ancient majesty of the empire. Narses defeated the Goths, the Franks, and the Alamanni; the Italian cities opened their gates to the conqueror, who entered the capital in triumph; and, having established the seat of his government at Ravenna, he continued to govern Italy under the title of exarch during fifteen years. His virtues, we are informed, were stained with avarice; and in this provincial reign he accumulated a treasure of gold and silver which surpassed the modesty of a private fortune. His government was oppressive and unpopular; and the general discontent was expressed with freedom by the deputies of Rome. Before the throne of Justinian they boldly declared that their Gothic servitude had been more tolerable than the despotism of a Greek eunuch; and that unless their tyrant were instantly removed, they would consult their own happiness in the choice of a new master. His disgrace was thus the effect of popular disaffection; and his death, though in an extreme old age, was unseasonable and premature, since his genius alone could have repaired the last and fatal error of his life. He died about the year 567, and, as some say, though it does not appear very probable, at the advanced age of ninety-five.

Narsingah ‖ Narva.

NARSINGAH, a town of Hindustan, province of Orissa, belonging to an independent Hindu chief, fifty-eight miles west by north from the town of Cuttack. Long. 85. 20. E. Lat. 20. 41. N.

NARSINGUR, a town of Bengal, in the district of Midnapore. It formerly possessed a good fortress, which has been allowed to fall into decay; but the town continues to flourish, being favourably situated for inland trade. Long. 86. 40. E. Lat. 22. 34. N.

NARSIPOOR, a town of Hindustan, in the Northern Circars, and in the district of Ellore. It is situated on the southern branch of the Godavery, and is forty-eight miles north-east from Masulipatam. Long. 81. 50. E. Lat. 16. 21. N.

NARUNGPORE, a town of Hindustan, province of Allahabad and district of Ghazypore, being delightfully situated on the western bank of the Ganges, opposite Buxar.

NARVA, a city of the government of St Petersburg, in Russia. It is the capital of the circle of the same same, which is extensive, but it contains only 16,000 inhabitants. The city is situated on the river Narowa, is surrounded with walls, and divided into the old and the new town. It contains three Greek and two Lutheran churches, with 460 houses, and 3750 inhabitants, who have several sawmills and flatting-mills, and make many nails. It has a small harbour, from which wood, flax, and hemp are exported, about a mile below the city. The place is remarkable for the battle fought there between the Swedes and Russians in 1700, when the army of the latter, amounting to 100,000 men, was defeated by the former with only 7000. Long. 27. 44. 25. E. Lat. 59. 21. 40. N.

Narwar || Nassau.

NARWAR, a town and district of Hindustan, in the province of Agra. The town is situated on the south-eastern side of the Sinde river, and is of considerable antiquity, having been conquered by the Mahommedans as early as 1251. It afterwards recovered its independence, and in 1509 was again under the government of a Hindu prince, from whom it was subsequently taken. This place was, in 1810, surrendered to Scindia. Long. 78. 12. E. Lat. 25. 41. N. The district is situated principally between the 25th and 26th degrees of north latitude, and is a woody and hilly country, of a rich soil in many parts, and extremely productive. The Sinde is the principal river, and the chief towns are Narwar, Collarass, and Shepoory. The lion has been found in this district.

NARYM, the chief town of a district of the same name in Asiatic Russia, traversed by the small river Narymka. It is situated on the Obi, near its confluence with the Ket. It was originally a simple ostrog or palisadoed fort, but now contains a church and 100 inhabitants. It is 200 miles north of Tomsk. Lat. 59. 13. N.

NASEBY, a parish of the county of Northampton, in the hundred of Guilsborough. It is situated in an agricultural part of the county, containing, in 1801, 538 inhabitants; in 1811, 598; in 1821, 697; and in 1831, 707. It is remarkable from the decisive victory obtained near it by Cromwell over the army of Charles I. in 1645, a victory which terminated the civil war of that period.

NASO, a town of the island of Sicily, in the kingdom of Naples and province of Demone, situated on a river of the same name, 110 miles from Palermo. It is in a healthy and lofty situation, on the site of the ancient city of Agathynum, and contains 8000 inhabitants.

NASSAU, a sovereign dukedom in Germany, the reigning family of which is distinguished by its antiquity, and the number of eminent men it produced at the most interesting period of European history. The founder of the sovereignty of this family was Waltram of Laurenburg, the ruins of whose castle stand on the banks of the Lahn. His sons divided the inheritance among them; but some branches becoming extinct, the whole were united again in the year 1523, under Count Adolph, and continued so till 1605, when, under Louis II. the territories were distributed among three of his sons, who thus became sovereigns with the title of Graffs or Counts. They were, first, Saarbruck, divided in the next generation into two branches, called Saarbruck-Sarbruck and Sarbruck-Usingen, both of which were again united in 1735; but the branch became extinct in 1797, and the land devolved on the present line: Secondly, Idstein, a branch which became extinct in 1721: Thirdly, Weilburg, on which all the states devolved, and since 1816 have formed but one principality. During the French revolution, the city of Saarbruck, with its territory upon the left bank of the Rhine, was seized by the republicans. It then comprehended 430 square miles of land, with 53,000 inhabitants; for which, at the pacification in 1803, it received an indemnification of 750 square miles and 93,000 inhabitants, which were added to the Grafschaft of Usingen. The Count of Weilburg had lost, on the left bank of the Rhine, 170 square miles and 19,000 inhabitants, for which he received on the other side of that stream a territory of 330 square miles, with 37,000 inhabitants. At the period when Napoleon instituted the confederation of the Rhine in 1806, the whole of these families had been united in the person of the existing prince, who then received, in addition to the former territories which he possessed, a tract of land of 650 square miles, with 84,500 inhabitants, and at the same time the title of duke was conferred upon the reigning prince.

At the peace which followed the capture of Paris, the territory assigned to the dukedom, as well as the title, were affirmed by the great powers; and by them it was stipulated, that in case of the extinction of that branch of the family of Nassau which filled the throne of the Netherlands, the present ducal family of Nassau should succeed to the inheritance of the duchy of Luxembourg. The stipulations on this subject seem to be at present the principal obstacles to an arrangement between the Dutch and the new kingdom of Belgium. Nassau.

The house of Orange-Nassau, which produced a race of distinguished heroes favourable to the reformation, and amongst others our King William III. was a branch, descended from Otho, a younger son of the house separated from the principal one in the year 1292. There were many intermarriages between the families at subsequent periods, and during the long contest in the Netherlands the Prince of Orange drew great aid, both in men and money, from his relations in the then countships of Nassau.

The dukedom of Nassau in its present state is bounded on the north-west and on the north by the Prussian Rhenish provinces; on the north-east by Hesse-Darmstadt; on the east by Prussia, Hesse-Casel, and Hesse-Homburg; on the south-east by the state of Francfort; and on the south and west by the Prussian territory and Darmstadt. It stands wholly on the right bank of the river Rhine, into which the small but navigable river Lahn falls. The surface, independently of the rivers, extends over 1812 square miles. It is divided into twenty-two ampts or bailiwicks. It contains ten cities, which are mostly small, but retain that denomination from having been once fortified, twenty-five market-towns, and 429 villages, with a population in 1834 of 370,374 inhabitants of both sexes. This district in 1817 contained, by the census then taken, only 301,907 individuals. In the year 1833 the births were, males 6690, females 6252; the deaths were, males 4557, females 4506; and the marriages were 3367.

The reigning house adheres to the Protestant religion; and the two sects of Lutherans and Calvinists have been united into one, assuming the title of Evangelical. There are 196,387 Protestants, 167,800 Catholics, 6009 Jews, and 184 Menonites. The Protestants of Nassau have a bishop, twenty deans, 178 pastors, and a theological seminary. The Catholics have a bishop and a commissary, fifteen deans, and 138 parish priests, and also a seminary for clerical instruction. Education is much extended and well conducted. At Weilburg there is a gymnasium or college; there are also several respectable grammar-schools, and 658 schools for popular instruction, under competent teachers, so that every child is taught reading, writing, and the common rules of arithmetic.

The government is hereditary in the present family, and, if it become extinct, it devolves on that branch of the Nassau family at the head of which is the king of Holland. By a charter granted in the year 1817, there are two houses of legislature; the upper consisting of hereditary members, of individuals of the royal family, and of a few mediatized princes, being six together; the lower house is elective, and consists of twenty-one members, amongst whom are the Catholic and Protestant bishops, and the director of the gymnasium of Weilburg, by virtue of their offices. These bodies rarely meet, and have little to do when they do assemble, as few alterations are made in the laws, and new taxes are not wanted.

The income of the state, independently of that of the duke, from which the public, civil, and ecclesiastical institutions are paid, is about L.180,000 per annum; but it has a debt charged on it amounting to near L.500,000, which is yearly diminished by a sinking fund. The personal income of the duke is very large, arising from his estates, houses, and mineral springs; but the amount is unknown, as are also the debts by which they are encumbered. The duke has a most magnificent palace on the right bank of the Rhine at Biberach, another at Wiesbaden, and seve-

Nassuck || Natal.

ral hunting seats for pursuing his favourite amusement in other parts of his dominions.

The military force of the dukedom consists of two regiments of infantry, one battalion of artillery, a company of pioneers, and a reserve corps serving as a kind of police. The contingent of Nassau to the Germanic confederation is fixed at 3026 men.

The face of the country may be represented as in general mountainous, though there are some rich and beautiful tracts of land near the river, about Hochst. There are two ranges of hills which run through the territory, viz. the Westerwald and the Taunus. The latter is the most picturesque, several of its points rising to 1000 feet above the level of the river; whilst some of the valleys in these hills contain the mineral springs, and the vast piles of building erected near them for the accommodation of their visitants. As these springs have been made familiar to the English public by the popular work entitled "Bubbles of the Brunnens of Nassau," we need here do little more than merely notice them. The baths of Ems are on a beautiful stream which runs into the Rhine; and on its banks are a great number of lodging-houses and hotels. Langen Schwallbach, about twelve hilly miles distant, in another valley, with the surrounding hills covered with woods, is pleasantly situated. It too is well provided with hotels and lodging-houses. Schlangenbad consists of but two large buildings, though with sufficient apartments for numerous parties. Wiesbaden is the most frequented, because the water is most highly valued for its curative effects, and has, besides, a greater variety of amusements than either of the other baths, being in contact with the city, which is a well-built place, containing more than 9000 inhabitants. One of these springs is most remarkable for the profit it yields to the duke, who is the proprietor of it, as well as of the others. Nieder-Selters supplies that water which is known in every part of Europe by the name of Seltzer. About one million of large and two millions and a half of small bottles or jugs are filled from the spring and sealed. The profit is stated to be about L.5000 per annum, after clearing all expenses; though it is said to have been purchased by an ancestor of the duke for a single pipe or butt of wine.

The agriculture of the dukedom produces sufficient corn and cattle for the consumption of the inhabitants, though it is generally conducted in a slovenly way. The vineyards produce sufficient wine of a moderate quality, and fruit of all kinds is plentiful and excellent.

NASSAU. See POGGY ISLES.

NASSUCK, a town of Hindustan, in the province of Aurungabad, ninety miles north from Poonah. Long. 73. 50. E. Lat. 19. 49. N.

NATAANA, a small village of Northern Hindustan, in the province of Serinagur, situated amongst mountains, and enjoying, in consequence of its elevation, a delightful climate during the summer months. The surrounding country has a naked appearance. Long. 78. 48. E. Lat. 20. 7. N.

NATAL, or NATAR, a Malay settlement on the south-western coast of the island of Sumatra, several miles south of the island of Tabuyong. It carries on a pretty considerable commerce; and, besides the English, who have had a settlement here since the year 1752, it is inhabited by settlers from the countries of Achin, Rau, and Menang Kabau. The English settlement was destroyed by the French in 1760, but was soon re-established, and the possession secured by the treaty of Paris in 1763. There is a considerable demand here for manufactured goods, such as piece-goods, opium, coarse cutlery, ammunition and guns, brass-wire, and China ware; the returns for which are usually made in gold and camphor. The gold from the interior is of a very fine quality, but it is frequently adulterated. The anchorage is about two miles off the shore, in five fathoms water. It is one of the worst roads on the western coast of Sumatra, having numerous shoals in it, and often a heavy sea running. The town is governed by a native magistrate, who has considerable sway; and the influence of the British East India Company was never so predominant here as in the pepper districts to the southward, owing to the wealth and independent spirit of the people. Long. 99. 5. E. Lat. 0. 18. N.

Nathdorah || Nattore.

NATHDORAH is a town of Hindustan, in the province of Ajmeer, where there is a celebrated Hindu temple, supported by considerable grants of villages, which are considered so sacred that the contending armies of the Rajpoots and Mahrattas have commonly respected them. The temple is occupied by innumerable Brahmins and devotees.

NATION, a collective term, used for a considerable number of people inhabiting a certain extent of land, confined within fixed limits, and under the same government.

NATIONAL DEBT, the money owing by government. See the articles ENGLAND, FUNDING SYSTEM, POLITICAL ECONOMY, and TAXATION.

NATIONAL EDUCATION. In the hope that we shall be able, at a more advanced stage of the work, to record the introduction by the legislature of a system of education for the people, we shall defer the consideration of the subject till we come to the article on UNIVERSITIES.

NATIVIDAD, a small island, situated in the North Pacific Ocean, about fourteen miles south-east of the island of Cerros. It is of a moderate elevation, about four miles in length, and of a dreary and barren aspect. Long. 244. 60. E. Lat. 27. 57. N.

NATIVITY, or NATAL Day, is the day of a person's birth. The word *nativity* is chiefly employed in speaking of the saints; as, the nativity of St John the Baptist, &c. But when we say *the* Nativity, it is understood of that of Jesus Christ, or the feast of Christmas.

NATIVITY, *nativitas*, a term in ancient law-books, which signifies bondage or servitude.

NATIVITY, in *Astrology*, the theme or figure of the heavens, particularly of the twelve houses, at the moment when a person was born, and called also the *horoscope*. Casting the nativity, or by calculation seeking to know how long the queen should live, &c. was made felony by the 23d Eliz. c. 2.

NATOLIA, the modern name of Asia Minor, the most westerly part of Turkey in Asia, and consisting of a large peninsula, which extends from the river Euphrates as far as the Archipelago, the Sea of Marmora, and the Straits of Gallipoli and of Constantinople, by which it is separated from Europe on the west. It is bounded on the north by the Black Sea, and on the south by the Mediterranean.

NATTRADACOTTA, a town of Hindustan, in the province of Tinnevelly. Long. 78. 10. E. Lat. 8. 46. N.

NATRUM, or NATRON, the nitre of the ancients, is one of the fixed alkalies. It is found in great abundance in many parts of Asia, where the natives sweep it up from the surface of the ground, and call it "soap-earth." The earliest account we have of it is in the Scriptures, where we find that the salt called *nitre* in those times would ferment with vinegar, and that it possessed a detersive quality, in consequence of which it was used in baths and in washing. Solomon compares the singing of songs with a heavy heart, to the contrariety of vinegar and nitre; and Jeremiah says, that even if the sinner should wash himself with nitre, his sin would not be cleansed off. These are properties which perfectly agree with this salt, but not at all with our saltpetre, which is the nitre of the moderns.

NATTAM, a town of Southern India, in the Polygar territory, fifteen miles east by south from Dindigul. Long. 78. 10. E. Lat. 8. 46. N.

NATTORE, a town of Bengal, in the district of Rau-

Natuna Isle || Natural History.

jeshahy, advantageously situated on the northern bank of the Attri River. Mulberry trees abound in the surrounding country, and on them are reared numerous silk-worms. Between Nattore and Jaffiergunge there is a very extensive morass, supposed to be the old bed of the Ganges; and here, during the rainy season, a sheet of water extends as far as Dacca, which is nearly 100 miles, navigable by boats, and in which tract are seen the villages erected on artificial mounds and groves of trees projecting out of the water to the right and left. Long. 88. 55. E. Lat. 24. 25. N.

NATUNA Isle, Great, an island in the China Sea, thirty-four miles in length by thirteen in average breadth. It is mountainous, and surrounded by numerous small rocky isles. It is situated in the 4th degree of N. lat. off the north-east coast of Borneo.

NATUNAS Isles, North, a cluster of very small islands in the China Sea. The best track for ships bound to China from October to December is past these islands to the north. Long. 109. E. Lat. 4. 45. N.

Natunas Isles, *South*, a cluster of small islands off the north-western coast of the island of Borneo, about long. 109. E. and lat. 3. N.

NATURAL, in general, is something which relates to or concerns nature.

Natural, in *Heraldry*, is a term used where animals, fruits, flowers, and the like, are blazoned with the colours they naturally possess, though different from the common colours of heraldry; and this is done to prevent armories being accused of falsity when blazoned with the names of colours unknown in heraldry.

Natural *Note*, in *Music*, is used in opposition to flat and sharp notes, which are called *artificial notes*.

Natural is also employed to indicate something coming immediately out of the hands of nature; in which sense it is opposed to *factitious* or artificial, which signifies something wrought or produced by art.

Definition.

NATURAL HISTORY. The objects of nature may be considered under two points of view; first, with respect to their form, structure, habits, and individual properties, when viewed in a state of inactivity; and secondly, with respect to the mutual changes which they produce when made to act upon each other. Hence the study of nature may be divided into two parts, namely, Natural History and Natural Science; the former considering bodies in comparatively an inactive state, and the latter in a state of mutual action.

Natural History, then, is that part of natural knowledge which teaches us to distinguish and describe the objects of nature; to examine their appearance, structure, properties, and uses; and to collect, preserve, and arrange them.[1]

Immensity of nature's works.

I. When we take a general survey of the objects with which we are surrounded, we are bewildered amidst the number and the variety which are everywhere presented to our view. The air, the woods, the fields, and the waters, teem with myriads of animals; a large proportion of the earth's surface is covered with a green mantle of luxuriant herbage, interspersed with plants and flowers of a thousand varied tints; and when we search below this, or when we explore the cloud-capt mountain, the gloomy mine, the sequestered cavern, or the rocky cliff, we discover a great variety of mineral substances, either piled into irregular masses, or lying in uniform beds or layers, disposed in veins or seams, or scattered at random through the other stony matters.

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To the casual observer, the number and variety of these objects would appear almost infinite, and he would consider it as impossible to enumerate them as to number the stars or count the sands on the sea-shore. This idea, however, arises from his seeing them lying in confusion and disorder. The naturalist, by separating them into those groups or classes in which they often naturally present themselves, has succeeded not only in distinguishing the several kinds from each other, but even in guessing pretty accurately at the number of species which have hitherto been discovered. In fact, there are two objects which should principally occupy the attention of the naturalist; first, to classify natural substances; secondly, to examine their structure.

Classification.

The number of natural productions being confessedly very great, it is necessary to find out some means of distinguishing them from each other, and of recognising them on seeing them anew. These means are the peculiarities, or the assemblages of peculiarities, which belong exclusively to each body. Now there is scarcely any substance which has a simple character, that is, which can be distinguished from every other substance by any one of its properties singly. It is only by the combination of several of these properties that we can distinguish an object from others which resemble it in possessing some one or more of those very properties; and the more numerous the species we compare, the more necessary it becomes to bring their properties together, in order to assign to each a character that may distinguish it from the rest. Hence, to distinguish a species, considered independently of all others that exist in nature, it is necessary to express in its character almost the whole of its properties; and the greater the number of these we take into the character, the more complete will be our description of the object. But no man can acquire a sufficiently accurate knowledge of all natural objects to enable him to give a complete description of them. Human life is too short to admit of the completion of such a task. All that can be expected from our limited faculties, is to acquire a general knowledge of natural objects, confining our principal attention to such as possess some striking qualities, or appear convertible to the useful purposes of life.

To attain this end, two modes of procedure have been adopted by naturalists. According to the first mode, characters are employed which rise by degrees from particulars to generals. They begin by comparing together a certain number of species which bear the nearest relation to each other. In drawing the characters of these species, it is requisite to express only those differences which, on a supposition that they are the most nearly related, form but a small part of their properties; and a number of species thus brought together constitutes what is denominated a *genus* or *tribe*.

The remainder of those properties which are common to all the species of the genus combine to form the character, or rather the description, of the genus, distinguishing it from all those which might be formed by bringing together other species; but the number of such common properties being still very considerable, the same means

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[1] Some writers divide natural history into *general* and *particular*, which have been accurately defined by Cuvier. *General natural history* considers, under a single point of view, all natural bodies, and the common result of all their actions in the great whole of nature. It determines the laws of the co-existence of their properties; it establishes the degrees of resemblance which exist between different bodies; and it classes them according to these degrees. The *Particular natural history* of any body, to be perfect, should comprehend, first, the description of all the sensible properties of that body, and of all its parts; secondly, the mutual relations of these parts, the motions which they produce, and the changes which they undergo whilst they remain united; thirdly, the active and passive relations of this body with every other body in the universe; and, fourthly, the explanation of all these phenomena. (See *Tableau Elémentaire d'Histoire Naturelle.*)

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are repeated, in order to reduce the characters of the *genera* to smaller terms. We compare together only those genera which most nearly resemble each other; and the generic characters now employed must only express those differences which form but a small part of their common properties. The properties which are common to all the genera compose a character which distinguishes this assemblage or group from all other groups of genera. Such an assemblage of genera is called an *order*.

Repeating the same operation, and bringing together such orders as are most nearly allied, we form a more general assemblage, called a *class;* and again uniting a certain number of classes, we form a higher division, to which naturalists have given the name of *kingdom*. This chain of divisions, in which the higher links comprehend the lower, forms what is called a *method*.

The other mode of procedure is to proceed gradually from generals to particulars, beginning with the slightest and most obvious differences, thus forming the first division or kingdom; dividing each kingdom into classes, each class into orders, each order into genera, each genus into species, and each species into varieties. This descending series constitutes what is called a *system*, and is that which has been generally adopted by naturalists.

In order to illustrate this systematical classification of natural objects, let us select a familiar example. Amongst the various creatures which pass under our observation, a great number are possessed of life, of sensation, and voluntary motion. These we call *animals*, and of them we form the *animal kingdom*. On examining various groups of animals, we find that many have four extremities, and suckle their young by means of teats, and these we call *quadrupeds* or *mammalia*, thus forming a *class of animals*. Again we find, that of the mammalia some have hoofed feet and blunt fore-teeth, and feed almost entirely on vegetables. These constitute an order of the class of mammalia, to which Linnæus has given the name of *belluæ*. Of this order a certain number of animals agree in having six fore-teeth in both jaws, and form a genus or tribe distinguished by this particular from the other animals of the same order, and commonly called the *horse* tribe. Lastly, in this tribe we find one species which has solid hoofs, a tail bristly at the end, an upright mane, and a black cross on the shoulder of the male. This species is the common *ass*.

Division of nature into kingdoms.

In framing an artificial system of natural history, most writers have agreed on the division of natural bodies into kingdoms, proceeding on the supposition that those marks which are to distinguish the objects of one kingdom from those of another are sufficiently fixed and certain. Let us examine for a little how far this supposition agrees with nature's works as we find them.

The division of natural objects commonly adopted is into three kingdoms; the animal, vegetable, and mineral. This division has been almost universally received as perfectly consistent with nature, and is by most persons conceived to be so clear and distinct, that they suppose it impossible to mistake in referring any particular object to its proper kingdom. This arises from their having noticed only such objects as bear evident marks of the division to which they belong; but if we draw their attention to a variety of other individuals, they will acknowledge themselves to be incompetent to the decision, or will erroneously refer to one division, what has, after accurate examination, been determined to belong to another.

There is one whole class of productions, called *zoophytes* by naturalists, which appear to form the connecting links between the different kingdoms. They are animals of the polypus kind, mostly covered with a calcareous crust, differing little in composition from the shells of lobsters, shrimps, and other shell-fish, and formed, like them, from an exudation or secretion on the surface of their bodies. These polypi are connected together by thousands, or even millions, and assume a great variety of appearances, according to their arrangement; the same species, however, always assuming the same, or very nearly the same, appearance. Some are connected together in the form of stem and branches, as the *flustræ*, *sertulariæ*, *corallines*, and others, many of which have their offspring in the egg state attached to them, and so situated as to bear exact resemblance to the seed-vessels of plants. These are altogether so like to many of the sea-plants, as to be generally confounded with them under the title of sea-weeds; but the attentive observer may, by examining them in their natural state, perceive the tentacula or feelers of each polypus extended in its search for food, and hastily retracting within its shell upon the least alarm. Many of this description are found attached to oysters or other shell-fish, and often to stones and pebbles which are covered or occasionally wetted by the sea.

Other zoophytes assume less regular figures, and are much more firm and solid, resembling the productions of the mineral kingdom. Madrepores and millepores, called often *brainstones*, are of this kind. At first sight they look very like stones and pebbles, or like pieces of chalk or marble; but on an accurate inspection, any one may perceive marks of an organic structure, and, when they are in a recent state, may detect the inhabitants of their numerous cells.

The above examples will perhaps suffice to prove how insufficient is either a hasty examination, or the judging by similarity of appearance, for determining to what kingdom of nature any particular object belongs. But there are many other productions to which few persons could, without hesitation, assign their places. For instance, where would we arrange the green powdery substance so common on paling; the spotted and streaked appearance on stones; the mould on cheese, or the green jelly-like matter which floats on the surface of the stagnant waters? Naturalists in general have assigned these productions to the vegetable kingdom; but Sennebier and a few others have maintained that some of them are animals.

According to some writers, the most philosophical notion which we can form on this subject is, that the division of natural objects into kingdoms is artificial, and that nature, acknowledging no such bonds, passes imperceptibly from the animal to the vegetable, and from the vegetable to the mineral world, without defining where the one ceases or where the next begins.

As the appearances of natural productions are insufficient, so are their properties and powers, for determining which are animals or which vegetables, according to the received acceptation of the terms. If locomotion is allowed to be the characteristic of an animal, where shall we place the oyster, or the zoophytes of which we have just been speaking, or where some species of *ulva* and *conferva*, plants that swim about detached in water? If feeling or sensation be the test, who shall decide that the sensitive plant (*mimosa pudica*) possesses it not? and who determine that the *leaves* of the fly-trap (*dionæa muscipula*), when they contract, and catch the fly as soon as it alights, do not feel the despoiler that comes to rob it of its honey? Though these and similar objections may certainly be made to the artificial division of nature's works into kingdoms, yet it is convenient to have such a division; and even the very difficulty of establishing to which kingdom any object belongs is an additional spur to the genius and industry of the naturalist.

Division of natural bodies into *organized* and *inorganic*.

The most natural division of the works of nature is that which distinguishes them into *organized* and *inorganic* bodies; and, on the whole, we have seen no attempt to establish the differences between these so successful as that adopted by M. Dumeril in his *Traité Elémentaire*

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d'Histoire Naturelle. "Some objects," says he, "as animals and plants, have formerly constituted a part of other individuals, similar to themselves, from which they have been separated at a certain period, under the form of eggs, of germs, or of little living creatures; and their existence is evidently owing to this generation; they are *born*. Others, on the contrary, as stones, salts, water, may be formed by certain circumstances, and even by ourselves at pleasure. They have not necessarily made a part of other similar bodies; their existence seems to depend on certain fortuitous circumstances, that have produced the approximation of their constituent principles, and their origin might be referred to attraction. These bodies are *formed*. Vegetables and animals, in increasing their size, only develope themselves. Whatever may be their minuteness, we shall, on a careful examination, find them already formed, with their parts requiring only to be evolved. Their increase proceeds from within outwards, by *intus-susception*. Stones, and a great many other bodies, are augmented only by the same matter from which they are produced; their growth takes place always from without, by a sort of aggregation.

"As the increase of the bodies which compose these two great subdivisions is not alike in both, a duration very different ought to be the result of these dissimilarities. In fact, minerals are susceptible of indefinite increase, and their end is always indeterminate; it is vague, and depends on the circumstances under which they are placed. Plants and animals ought, from the same circumstances which favoured their development, to stop when their extension has been carried to the highest degree, so that the end or death of these bodies is fixed and necessary.

"The masses in which stones and other similar bodies generally present themselves are angular, insulated, and very variable in their size. The individuals which we call plants and animals have always, and necessarily, a form that is constant, for the most part rounded and symmetrical, and their extension is limited within certain bounds.

"There is this great difference between these bodies, that those which increase by aggregation may be divided into molecules, or parts infinitely small, bearing a very near resemblance to the mass from which they were taken; while in those which develope themselves, no portion can be taken away and exist by itself, at least unless it develope new parts, which replace those that are wanting.

"The bodies which do not develope themselves are in general formed of fluids or solids which remain constantly in the same points; they are composed of very few elements, which may be separated and again reunited. The bodies which develope themselves, on the contrary, are essentially composed of solids and fluids, which are always changing, and in a state of renovation; they have always, and from necessity, more or less consistence; they are penetrated and augmented by fluids; and after being decomposed, they can never be formed again such as they were before."

Division of natural history.

For the more convenient study of natural history, the whole subject may be divided into five great branches, namely, meteorology, hydrography, mineralogy, botany, and zoology. Meteorology includes the description of all those phenomena which take place in the atmosphere that surrounds the terrestrial globe. See the article METEOROLOGY. Hydrography comprehends the natural history of the sea, of rivers, lakes, and other collections of water that make up so large a part of the earth. See the article PHYSICAL GEOGRAPHY. Mineralogy is that part of the subject which treats of the solid inorganic bodies that are found on the surface or in the bowels of the earth. See the article MINERALOGY. Botany comprehends the natural history of vegetables. See the article BOTANY. And zoology includes the natural history of all animated beings, and is subdivided into many subordinate classes. The classification followed in this work is fully explained in the article ANIMAL, where also the reader will find a view of all the other systems.

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It is not surprising that naturalists of taste and genius, observing the gradation which seems to take place amongst the works of nature, should have been led to form the notion that there exists a regular series or chain of beings, the links of which, if we could discover them all, would be found to resemble each other so nearly, as only to exhibit to the superficial observer a few shades of difference. *Natura non per saltum movet*, has become a sort of axiom in natural history.

The notion of a chain of being is alluring, and does not want arguments in its favour. The Esquimaux Indian, or the inhabitant of Terra del Fuego, seems scarcely superior in form, and very little in intellect, to the oran-utang; the *platypus*, the flying *lemur*, flying squirrels, and, still more, the bats, appear to form the connecting links between quadrupeds and birds; while the seals, the *walrusses*, and the whole order of *cete*, connect the former with the fishes. In this latter class, the flying fish, in its capability of supporting itself in the air, seems to approach the feathered tribes; while some of these, as the penguins, in their habits and manner of life bear some distant resemblance to fishes. Again, the siren and the eels so nearly resemble each other, that it has been disputed whether the former should be reckoned among the *amphibia* or the *fishes*; whilst one species of lizard (*lacerta lumbricoides*) is so like an earthworm, as apparently to connect the *amphibia* and the *vermes*. Farther, the diminutive humming-bird (*trochilus exilis*) and the humble-bee (*apis terrestris*) are so nearly alike, both in size and manner of life, as to form no very exceptionable links of union between the birds and the insects.

If, again, we compare the vegetable tribes with some of the inferior classes of animals, we shall perceive many points of resemblance, which may seem to indicate a continuance of the same chain. Besides the *mimosa pudica* and *dionæa muscipula*, already mentioned, the *hedysarum gyrans* or moving plant is a remarkable instance of the mobility of vegetables; the carrion flower (*stapelia hirsuta*), and some species of *morel*, bear the odour of putrid animal substances; while, on the other hand, the *mantis siccifolia* might be mistaken for a dried leaf; several species of *pennatula* (sea pens) and *sertularia*, for ferns; the *madrepora fungites* (mushroom madrepore), for a petrified mushroom; and the *tubularia magnifica* and *actiniæ*, when expanded, for the most beautiful full-blown flowers.

Lastly, on comparing the mineral kingdom with the classes of organized beings, we find several so nearly resembling stones, as scarcely to be distinguished from them.

But although the view which we have given above, of the circumstances that have led naturalists to form the idea of a regular chain of beings, is specious, it will not bear the scrutiny of a strict examination. The resemblances which we have pointed out are more apparent than real; and anatomy and chemistry, added to a more accurate acquaintance with the works of nature, have proved that those links which, to superficial observers, appear most allied, are yet separated by considerable chasms. In fact, if we were to admit these resemblances as ever so accurate, they would lead us to form, not one chain, but many.

NATURAL PHILOSOPHY is commonly defined to be that branch of knowledge which considers the powers and properties of natural bodies, and their mutual actions on one another. This term serves to indicate, not one, but a cluster of sciences. Those generally comprehended under it are the following, viz. 1. Mechanics; 2. Hydrostatics; 3. Optics; 4. Astronomy; 5. Magnetism; 6. Electricity. There are, in this work, distinct treatises on all

Naturalisation ‖ Naumachia.

these different branches, introduced in the order of the alphabet; whilst the history of the whole is traced, in a connected method, in the second *Preliminary Dissertation*, contained in our first volume. In connection with the foregoing articles, the reader is also referred to those on PHILOSOPHY and PHYSICS, for some general views respecting the nature of philosophy, and the proper manner of philosophizing.

NATURALISATION, in *Law*, the act of naturalising an alien, or putting him into the condition of a natural-born subject, and entitling him to the rights and privileges of that condition.

NATURE, according to Mr Boyle, has eight different significations. It is used to signify the author of nature, whom the schoolmen call *natura naturans*, being the same with God. By the nature of a thing we sometimes mean its essence; that is, the attributes which make it what it is, whether the thing be corporeal or not; as when we attempt to define the nature of a fluid, of a triangle, or the like. Sometimes we confound that which a man has by nature with what accrues to him by birth; as when we say that such a man is noble by nature. Sometimes we take nature for an internal principle of motion; as when we say that a stone by nature falls to the earth. Sometimes we understand by nature, the established course of things. Sometimes we take nature for an aggregate of powers belonging to a body, especially a living one; in which sense physicians say that nature is strong, weak, or spent, or that, in such and such diseases, nature left to herself will generally perform the cure. Sometimes we use the term nature for the universe, or whole system of the corporeal works of God; as when it is said of a phœnix, or chimera, that there is no such thing in nature. Sometimes, too, and that most commonly, we express by the word *nature*, a kind of semi-deity, or other strange kind of imaginary being.

NAUCRARI, amongst the Athenians, was the name given to the chief magistrates of the δημοι, that is, of the boroughs or townships, called ναυκραριαι; because each was obliged, besides equipping two horsemen, to furnish one ship for the public service.

NAULUM, in Roman antiquity, a piece of money put into the mouth of a person deceased, to enable him to pay Charon, the ferryman, for his passage. It required to be of the current coin of the reigning emperor; and hence from this money the time of the person's death may be known. The sum for poor men was about a farthing, but the rich in general were very liberal to Charon, as appears from the number of coins often found in the neighbourhood of Rome upon opening the graves of great men. A similar custom prevailed amongst the Greeks. The money put into the mouth of the deceased was by them called δαναχη.

NAUMACHIA, in *Antiquity*, a public show or spectacle amongst the ancient Romans, representing a sea-fight. These mock fights are supposed to have originated at the time of the first Punic war, when the Romans first instructed their men in the knowledge of naval affairs; but afterwards they were intended to entertain the populace, as well as to improve the seamen. They were often, like other shows, exhibited at the expense of individuals, who thus sought to increase their popularity.

In these spectacles they sometimes strove to excel each other in swiftness, and sometimes engaged in a warlike manner. The naumachia of Claudius, indeed, was a most savage diversion, where the combatants used to destroy each other to amuse a tyrant and a cruel mob. As they passed before him, they used this melancholy greeting, "Ave, Imperator, morituri te salutant." The emperor replied, "Avete vos." This they understood as an answer of kindness, and a grant of their lives; but they soon discovered that it proceeded from wanton cruelty and barbarous insensibility. In the time of the Emperor Domitian, the number of vessels engaged would have nearly formed two regular fleets for a real fight, and the channel of water was equal in magnitude to a natural river. The Emperor Heliogabalus is reported to have filled the channel where the vessels were to ride with wine instead of water. Tritons and sea-monsters were frequently exhibited during the engagement. Suetonius and Dion Cassius inform us, that at one of the sea-fights of Domitian there fell a violent shower of rain; the emperor, however, continued till the end of the engagement, often changing his clothes; nor would he suffer any one to depart, and as the rain continued to fall for several hours, many were seized with distempers, and some even died. (Sueton. cap. 4; Dio. lib. lxvii.) Naumachiæ were also places fitted up for these shows, being a sort of circi or amphitheatres, with seats and porticoes. There were several of them at Rome, namely, three built by Augustus, one by Claudius, another by Domitian, and another by Nero, which served for the reverse of his medals. Claudius used the Lake Fucinus as a naumachia.

Naumburg ‖ Nauplius.

NAUMBURG, a city of Prussia, in the government of Merseburg, the capital of a circle of its own name. It stands on the river Saale, in a fertile district, contains a castle and six churches, a fine market-place, and (including the suburbs) 1130 houses, with 9320 inhabitants. It has several institutions for the education of the various classes, and much trade in leather, iron, beer, corn, spirits, wool, and other articles, which is promoted by some fairs of long continuance. There are vineyards near it, from which some wine, but more vinegar, is made. Long. 11. 34. 40. E. Lat. 51. 8. 55. N.

NAUPACTUS, or NAUPACTUM, in *Ancient Geography*, a city of Ætolia, at the mouth of the Evenus. The word is derived from ναυς and πηγνυμι, because it was there that the Heraclidæ built the first ship which carried them to Peloponnesus. It originally belonged to the Locri Ozolæ, and afterwards fell into the hands of the Athenians, by whom it was given to the Messenians, who had been driven from Peloponnesus by the Lacedæmonians. After the battle of Ægospotamos, it became the property of the Lacedæmonians; but it was restored to the Locri. Philip of Macedonia afterwards took it, and gave it to the Ætolians; and from this circumstance it has generally been called one of the chief cities of their country. Long. 22. 20. E. Lat. 38. 0. N. On the shore there was a temple of Neptune, and near it a cave filled with offerings, and dedicated to Venus, where widows resorted to request new husbands of the goddess. (Pausanias, lib. x. p. 898.)

NAUPLIUS, in fabulous history, a son of Neptune and Amymone, was king of Eubœa, and the father of the famous Palamedes, who, by the artifice and resentment of Ulysses, was so unjustly sacrificed by the Greeks at the Trojan war. The death of Palamedes highly enraged Nauplius; and, to revenge the injustice of the Grecian princes, he endeavoured to debauch their wives, and ruin their characters. When the Greeks returned from the Trojan war, Nauplius was pleased to see them distressed in a storm on the coasts of Eubœa; and, to render their disaster still more universal, he lighted fires on such places as were surrounded with the most dangerous rocks, that the fleet might be shipwrecked upon the coast. This had the desired effect; but Nauplius was so disappointed when he observed that Ulysses and Diomedes had escaped from the general distress, that he threw himself into the sea. According to some mythologists, there were two persons of this name; one a native of Argos, the son of Neptune and Amymone, who accompanied Jason to Colchis; and the other king of Eubœa, who lived about the time of the Trojan war, and, according to some, was the son of Cly-

Nauscopy ‖ Navan.

tonas, one of the descendants of Nauplius the Argonaut. The Argonaut was remarkable for his knowledge of naval affairs and of astronomy. He built the town of Nauplia, and sold Auge, daughter of Aleus, to King Teuthras, in order to screen her from her father's resentment.

NAUSCOPY, the art of discovering the approach of ships or the neighbourhood of land at a considerable distance. This pretended art was discovered by M. Bottineau, who was employed in the Isle of France from the year 1782 to 1784. The account given of it is as follows: "This knowledge is not derived either from the undulation of the waves, or from the subtilty of sight, or from any particular sensation; but merely from observation of the horizon, which discovers signs indicating the proximity of ships or of land. On the approximation of a ship toward the land, or towards another ship, there appears in the atmosphere a meteor of a particular nature, visible to every one without any painful attention. It is not by any kind of accident that this meteor appears under these circumstances; on the contrary, it is the necessary result of the approximation of one vessel towards another, or towards the land. The existence of the meteor, and the knowledge of its different modifications, are what constitute the certainty and precision of my information. If I am asked how it is possible that the approach of a ship towards land should give birth to any meteor whatsoever in the atmosphere, and what connection there can be between two objects at such a distance from each other; I reply, that I am not obliged to give an account of the hows and wherefores; that it is sufficient for me to have discovered the fact, without being obliged to account for its principle." Upon this we shall only observe, that the whole seems to be the work of fancy.

NAUTPOOR, a town of Bengal, in the district of Purneah, on the Cosah river, forty-two miles north-north-west of Purneah. Long. 16. 58. E. Lat. 26. 17. N.

NAVACOTT, a town of Northern Hindustan, subject to the Ghoorkah rajah of Nepaul, 105 miles north-east from Catmandoo. Long. 83. 37. E. Lat. 28. 57. N.

NAVAL means something relating to a ship (*navis*).

Naval *Camp*, in *Antiquity*, a fortification, consisting of a ditch and parapet on the land side, or of a wall built in the form of a semicircle, and extended from one point of the sea to another. This was sometimes defended with towers, and beautified with gates, through which the ancients issued forth to attack their enemies. Towards the sea, or within it, they fixed great pales of wood, like those in their artificial harbours; and before these the vessels of burden were placed, in such order that they might serve instead of a wall, and give protection to those within. In this manner Nicias is reported by Thucydides to have encamped himself; but it seems only to have been practised when the enemy was thought superior in strength, and raised great apprehensions of danger. When their fortifications were considered strong enough to defend them against the assaults of enemies, it was frequent to drag their ships to shore, which the Greeks called ἑνωλκειν, and the Romans *subducere*. Around the ships the soldiers disposed their tents, as appears everywhere in Homer. But this seems to have been practised only in winter, when the enemy's fleet was laid up and could not assault them; or in long sieges, and when they were in no danger from their enemies by sea, as in the Trojan war, where the defenders of Troy never once attempted to encounter the Grecians in a sea-fight.

Naval *Crown*, amongst the ancient Romans, a crown adorned with figures of prows of ships, and conferred on persons who, in naval engagements, had first boarded an enemy's vessel.

Naval *Tactics*, the warlike operations of fleets. See Tactics, *Naval*.

NAVAN, a borough-town of Ireland, in the county of Meath and province of Leinster, about thirty miles north-west of Dublin, situated at the junction of the Boyne and Blackwater, near the canal called the Boyne Navigation. The situation of the town, in the centre of a great corn country, produces an excellent corn market; and its abundant supply of water affords great facilities for flour-mills and trading in flour. The landed property originally belonging to the corporation is said to have amounted to about 1200 acres; but it has been from time to time encroached upon by the neighbouring proprietors, and otherwise disposed of, till it has at length dwindled down to less than 150 acres. By the census of 1831, the population of Navan amounted to 4416; males 2085, females 2331. The families employed in agriculture were 403; in trade, manufactures, and handicraft, 305; not comprised in the preceding classes, 200. The proportion of Roman Catholics to Protestants is as ten to one. There are very few Protestant dissenters in the district.

Navarino.

NAVARINO, Navarin, or Neo Castro, is a town of Greece, in the Morea, celebrated for the excellence of the harbour on which it stands. This harbour is formed in front by the narrow island Sphagia, the ancient Sphacteria, which is three miles in length. The entrance, which is at the south end of the island, is less than a mile broad, but the harbour opens to a width of three miles, and its general depth, with the exception of two shoal spots, varies from twelve to twenty-seven fathoms. This harbour is so spacious, and so well secured from the sea, as to admit of the largest fleet anchoring and riding in it with perfect safety.

At two periods very remote from each other this harbour has been the scene of remarkable naval victories. The first was during the Peloponnesian war, 425 before Christ, when the Athenian fleet under Demosthenes pursued the Spartans, who were more powerful, and entirely destroyed their fleet within the harbour; in consequence of which the Spartans sued for peace. During the revolutionary war in Greece, the city was taken by the Greeks under the command of Ypsilanti in 1821; but, in consequence of a mutiny of the Moreotes, who formed the garrison, then commanded by Kolokotrone, it capitulated, on the 23d of March 1825, to Ibrahim Pasha, the son of the viceroy of Egypt, who thus secured an important naval asylum, from which to accomplish the subjugation of Greece. The united fleets of Turkey and Egypt were collected in the harbour, where they had anchored, having escaped a meeting with a united fleet of English, French, and Russian ships, who had been authorized to prevent their advancing to Greece. The united fleet of the three powers entered the harbour, and some slight, possibly undesigned hostilities, having occurred, a general attack was made on the Turkish and Egyptian fleets. The English admiral, Codrington, had the chief command, whilst under him Admiral Rigny commanded the French, and Count Heyden the Russian squadron. The attack took place on the 20th of October 1827, and, after some hours of fierce and bloody contention, it terminated in the destruction of the Turkish and Egyptian fleet, the greater part of which was either burned or sunk. This action, however it may be viewed in point of justice or policy, decided the question as to the independence of Greece. The Egyptians were expelled from the Morea; and the sultan, having lost his fleet, found himself obliged to legitimate a revolution which he had laboured in vain to put down. In fact, the battle of Navarino, described at the time as "an untoward event," proved, in its consequences, fatal to Turkey; it secured to Russia the undisputed command of the Black Sea, and thus enabled her, in the campaigns of 1828 and 1829, to obtain those advantages which ultimately led to the humiliating treaty of Adrianople.

The city of Navarino stands on the south-east side of the harbour. It is surrounded by a wall without any ditch, and

Navarre. is commanded by a fortress on a height, which is a regular hexagon, defended by five towers at the external angles, but without ditches, ramparts, or outworks. From the sea a frigate or two might easily batter down the walls. The city once contained between 6000 and 7000 inhabitants; but many of them retired into Arcadia during the bombardment of the Egyptians in 1825, an epidemic disease soon after augmented the depopulation, and the peace has not yet fully replaced these losses.

NAVARRE, an ancient kingdom, which has long existed under this name, and is divided into two portions; one on the south side of the Pyrenees, distinguished by the name of Upper Navarre; and the other on the north side of the same range of mountains, called Lower Navarre. They remained one kingdom, with a common language and a common constitution, till the year 1512, when Ferdinand, king of Aragon, seized upon Upper Navarre, and added it to his other dominions, but confirmed to it the title of a kingdom, and agreed to guarantee its ancient constitution. The other part continued an independent kingdom, having Bearn for its capital, till its king ascended the throne of France under the name of Henry IV. His claim to that dignity was founded on the marriage of his father, Anthony of Bourbon, with the heiress of the crown of Navarre, who was a Protestant, and educated her son in that profession, which, however, he abjured in order to secure the French crown.

The country here described, and which alone retains the name, is one of the northern provinces of Spain. It is bounded on the northern side by the Pyrenean Mountains, which separate it from France; on the east and south-east by the province of Aragon; and on the south and south-west by the provinces of Alava and Soria. The extent is about 2470 square English miles. No part of it touches on the sea. It is divided into the five districts of Pampeluna, Sanguessa, Estella, Tudela, and Olite. According to the census of 1833, it contained 288,284 inhabitants, thus showing an increase of 66,556 persons since the former census of 1797. It contains nine cities, 282 towns, and 630 villages. At the census of 1797, when the whole inhabitants amounted to 221,728, they were thus classed by Canga Arguelles: Nobles or gentlemen, 18,753; labouring proprietors, 17,358; 7574 renters of land, 12,578 day-labourers, 7931 artisans, 782 merchants, 582 clerks to traders, 5766 domestic servants, 2778 secular clergy, 1287 regular clergy, and 607 female religious. The same author gives an estimate of the value of the whole property of the province, which he states as worth L.1,541,478. The system of taxation differed in this, as in the Biscayan provinces, from that practised in the other parts of Spain, and produced annually in direct taxes only L.33,557, and 398 arobas of wheat; but the crown had, besides, allotted to it several estates, certain revenues from the *real patrimonio*, and some feudal rights to personal services, which added somewhat, though but to a small amount, to the income.

Navarre still possesses the name of a kingdom, and has a constitution of very ancient origin, founded on the practices of ancient times at a period long prior to its amalgamation with the crown of either Aragon or Castille. The king was elected from the chiefs, and his investiture was pronounced to him in words to this effect: "We, who are your equals, select you for our king, to obey and protect our laws, which, whilst you continue to do, we shall obey you; but when you cease to do so, we shall put an end to your power." At the installation of the successive kings of Spain, since the Basque provinces and Navarre have been under their guidance, they have sworn to preserve to them the ancient laws and usages; and though frequent attempts were made by those monarchs to extend their power, the adherence to the ancient constitution was firm, and sufficiently powerful to act as a check on the arbitrary advances of the general government of Spain. Thus the people opposed the introduction of the Inquisition into these provinces, at a time when all the rest of the Peninsula was groaning under the oppression of that formidable institution, and it was never suffered to exercise any portion of its authority. A tradition still exists, that when the agents of the Holy Office went from Castille on a message to the Biscayans, to recommend that institution to their adoption, they were met by the deputies on the very frontier of the states, and sternly told, "Thus far, but no farther, shall ye come." Navarre.

These northern provinces of Spain had a representative government, in the choice of which the members of every head of a family had a vote. It assembled every second year, or oftener if deemed necessary. Their chief business was to vote the requisite sums for the public service, to audit the expenditure of the money, and more especially to watch over any infringements which might be attempted on their ancient rights and privileges. The principal of these privileges were, that the king could only nominate natives to ecclesiastical appointments; that no native should be civilly or criminally answerable to any Castillian tribunal; that every man's house was his sacred castle; that it could not be entered to arrest him till he had been previously summoned, which, if obeyed, he was, on his appearing, instantly tried, and either liberated, or bailed, or punished, according to the nature of the evidence and of the offence. No orders from the Castillian king were complied with until they were communicated to the parliament, and approved. There were other rights claimed and exercised, and, in fact, the condition of these provinces with respect to the king of Spain was nearly similar to that which existed between the emperor of Germany and the cantons of Switzerland, at the time when the house of Austria made the attempt to bring them under the same system of government as its hereditary dominions.

This free constitution, weakened indeed in some of its parts, was maintained till the invasion of Spain by Napoleon; and his whimsical project of a government was announced, but never practically adopted. The democratic Cortes of 1812 swept away all ancient privileges; but they were restored on the recovery of the throne by Ferdinand in 1814. The revolutionary Cortes of 1820 again abolished them, and they were once more restored after the king's liberation from his imprisonment at Cadiz. Not long before the death of Ferdinand, his ministers thought to extract a larger revenue from these provinces, by the abolition of their ancient rights; and a long investigation was made into the nature of their *fueros*. On this occasion, Don Carlos, then the heir apparent to the crown, became convinced of the legitimacy of their claims, and is said to have declared, that if any good should eventually arise from adopting the proposal of the ministry, it was not to be obtained by a positive violation of the royal faith, and that the proposition itself was an insult to Castillian honour. To this latter occurrence may chiefly be attributed the warm accession of these northern provinces to the claims which Don Carlos has since asserted, and the zeal they have exhibited during the horrible civil war which is still ravaging the whole Peninsula.

The province is of very unequal surface. The northern part comprehends a portion of the range of the Pyrenean Mountains, though none of the very highest peaks, which are all within the French boundary; but the Sierra de Andia, the Barbena del Rey, and the Hill of Montereal, are of such elevation as to be covered with snow the greater part of the year. From the main body of the principal range many spurs are projected into the valley, and between them are extended tracts of undulating surface, presenting both picturesque and fertile districts. Beyond the termination of these mountain spurs there is an ex-

Navarre. tensive level country, extending to the river Ebro, which forms the western boundary of the province.

Navarre is purely an agricultural country, except some mining districts, and is watered by the river Ebro, which receives the water of the Ezca, the Arga, the Alhama, and the Queilles, and their tributary rivulets. It is thus abundantly irrigated, and affords rich meadows, well adapted for the breeding and fattening of large herds of black cattle, and for furnishing abundance of butter and cheese. The climate is moist; and owing to that circumstance, combined with the numerous rivulets, the grazing lands preserve a perpetual verdure; but the climate, though moist, is by no means insalubrious, nor does a more healthy or hardy race exist than the rural inhabitants of this province.

The agriculture is very skilfully conducted, though in the vicinity of the mountains the soil is sometimes stony, and in almost all parts so difficult to plough as to require a numerous team of oxen. The rotation of crops is commonly one of four years; first, wheat; second, beans; third, wheat; and fourth, maize. The product is considerably beyond the home consumption. The other articles cultivated are hemp, flax, madder, and liquorice. The woods, consisting chiefly of beech, or fir, or chestnut, supply fuel; and the nuts of the latter are used as a substitute for bread. The sheep are numerous, but, with the exception of the merinos, of which about 7000 lambs are yearly reared, not of the best description, and yield only a coarse wool. The rivers abound with fish, especially trouts, some of which weigh from ten to twelve pounds. The woods are well stocked with game, such as wild goats, roebucks, hares, and, of the feathered tribes, pheasants, partridges, and woodcocks; besides which there are beasts of prey, such as bears, wolves, and especially lynxes, which prove very injurious to the live stock.

In the warmer spots olive trees flourish, and yield oil. Many places produce honey and wax; whilst, in other districts, wine, cider, and fruits are collected, sufficient to supply the wants of the inhabitants.

The mineral products consist principally of iron; but some copper, lead, sulphur, and a little silver, is obtained. The iron is converted into articles for use, or for trade with the surrounding provinces. The articles for clothing are provided by domestic manufactures. There are few workmen in any fabrics, except in Pampeluna, where some silk goods and a little paper are made; and in Tudela and Estella, where there are distilleries for providing brandy, and where paper, parchment, combs, and barrel staves, are made.

Navarre is remarkable in Spain for the beauty and convenience of the public roads, which, from the capital to all the extremities of the province, are repaired, as often as they require it, at the general expense; but since their construction in 1750 they have needed but little additional labour or expenditure. The greatest attention is, however, paid to them, and much zeal exercised by the authorities to preserve them in good order.

The Canal of Aragon, as it is called, may more properly be considered as appertaining to Navarre, as it begins within that province, about two miles from Tudela, where, by means of sluices, the river Ebro is turned into and fills it. Barges of eighty or ninety tons' burden can at present navigate to the distance of eighteen leagues; and it was intended to carry on the work ten leagues farther, till it reached the point where the river Martin pours its waters into the Ebro. If this project could be accomplished, it would create a continued intercourse, by internal navigation, from the province of Navarre to the Mediterranean Sea. In its present state it is of incalculable advantage, both by facilitating the conveyance of weighty commodities from Tudela to Saragossa, and by the power it gives of irrigating more than 40,000 acres of land, which the want of water frequently rendered utterly unproductive. This stupendous canal was commenced in the reign of Charles V., but suffered interruption during more than two hundred years. In the latter part of the last century, however, the work was resumed; and, though recent events have caused it to languish, it has engaged the attention of the local treasuries of Navarre, Aragon, Catalonia, and Valencia, who entertained hopes of being able to furnish supplies, so as to continue the operations. The province of Aragon has for several years contributed 50,000 dollars; the tonnage received has amounted to 10,000 dollars, and the receipts from the irrigated lands to 150,000 dollars. The expense of repairs and cleaning thus leaves but a small sum applicable to the extension of the undertaking. The canal is ten feet in depth, and is seventy-five feet wide at the top, but slopes regularly towards the bottom. In both dimensions it exceeds the Canal of Languedoc, of which the French make such a boast. The inhabitants of Navarre have all the general characteristics of mountaineers, being brave, generous, active, and very much attached to their old habits. Being but thinly scattered, there is little literature amongst them; and though the Inquisition was never introduced, yet they are most zealous adherents of the church of Rome. There are two bishops, one at Pampeluna, the other at Tudela, and many convents and monasteries. The common language is the Basque; but, amongst those who speak Spanish, a great number of French and some Catalan words are in use. The cities are few. Pampeluna, the capital, is strongly fortified, and in war forms an important post. It contains about 15,000 inhabitants. The other cities and their population are, Tudela, 7000; Estella, 4500; Olite, 3000; and Sanguessa. Navarre || Nave.

Navarre, *Martin*, surnamed *Azpilcucta*, because he was born in the kingdom which bears that name, was successively professor of jurisprudence at Toulouse, Salamanca, and Coimbra, and universally consulted as a great oracle of law. For a part of his knowledge he was indebted to the schools of Cahors and Toulouse, in which he had studied. His friend Carewza, a Dominican, and archbishop of Toledo, having been charged with heresy by the Inquisition at Rome, Navarre set out, at the age of eighty, to defend him. Pius V. appointed him assessor to Cardinal Francis Alciat, vice-penitentiary. Gregory XIII. never passed his gate without sending for him; sometimes conversed with him for an hour together on the street; and even deigned to visit him, accompanied by several cardinals. But these honours did not render him more haughty. His character became so eminent, that even in his own time the greatest encomium which could be paid to a man of learning was to say that he was a *Navarre*. Azpilcucta was the oracle of the city of Rome, and of the whole Christian world; and for the influence which he had acquired he was indebted not only to his knowledge, but also to his known probity and virtue. Faithful to the duties which the church prescribed, his temperance and frugality preserved to him a vigorous constitution; and at a very advanced age his genius was still equal to the severest study. His savings enabled him to give liberal assistance to the poor; indeed, his charities were so great, that his mule, it is said, would stop as soon as she perceived a beggar. He died at Rome in 1586, at the age of ninety-two. His works were collected and printed in six vols. folio, at Lyons, in 1597, and at Venice in 1602; but they display more learning than judgment, and are now very seldom consulted.

NAVE, in *Architecture*, is the body of a church, where the people are disposed, reaching from the baluster, or rail of the door, to the chief choir. Some derive the word from the Greek *ναος*, *a temple*, and others from *ναυς*, *a ship*, by reason that the vault or roof of a church bears some resemblance to a ship.

NAVIGATION.

Navigation. NAVIGATION is the art of conducting a ship from one port or place to another.

HISTORY.

History. The profane poets refer the invention of the art of navigation to their heathen deities, though historians ascribe it to the Æginetes, the Phœnicians, the Tyrians, and the ancient inhabitants of Britain. Scripture refers the origin of so useful an invention to God himself, who gave the first specimen of navigation in the ark built by Noah under his direction.

However, profane history represents the Phœnicians, especially those of their capital Tyre, as the first navigators; being urged to seek a foreign commerce by the narrowness and poverty of a slip of ground they possessed along the coast, as well as by the convenience of two or three good ports, and by their natural genius for traffic. Accordingly, Lebanon and the other neighbouring mountains furnishing them with excellent wood for ship-building, they in a short time became masters of a numerous fleet; and constantly hazarding new navigations, and settling new trades, they soon arrived at an incredible pitch of opulence and populousness, insomuch as to be in a condition to send out colonies. The principal of these was Carthage, which, keeping up the Phœnician spirit of commerce, in time not only equalled Tyre itself, but vastly surpassed it, sending its merchant fleets through the Straits of Gibraltar, along the western coasts of Africa and Europe, and even, if we may believe some authors, to America itself.

Tyre, whose immense riches and power are represented in such lofty terms both by sacred and profane authors, was destroyed by Alexander the Great, upon which its navigation and commerce were transferred by the conqueror to Alexandria, a new city, admirably situated for these purposes, and intended to form the capital of the empire of Asia, of which Alexander then meditated the conquest. And thus arose the navigation of the Egyptians, which was afterwards so much cultivated by the Ptolemies, that Tyre and Carthage were quite forgotten.

Egypt being reduced into a Roman province after the battle of Actium, its trade and navigation fell into the hands of Augustus, in whose time Alexandria was only inferior to Rome; and the magazines of the capital of the world were wholly supplied with merchandize from the commercial capital of Egypt.

At length Alexandria itself underwent the fate of Tyre and Carthage, being surprised by the Saracens, who, in spite of the Emperor Heraclius, overspread the northern coasts of Africa, whence the merchants being expelled, Alexandria has ever since been in a languishing state, though it still has a considerable share of the commerce of the Christian merchants trading to the Levant.

The fall of Rome and its empire drew along with it not only the overthrow of learning and the polite arts, but that of navigation; the barbarians, into whose hands it fell, contenting themselves with the spoils of the industry of their predecessors. But no sooner were the braver amongst those nations well settled in their new provinces, some in Gaul, as the Franks, others in Spain, as the Goths, and others in Italy, as the Lombards, than they began to learn the advantages of navigation and commerce, and the methods of managing them, from the people they had subdued; and this with so much success, that in a little time some of them became able to give new lessons, and set on foot new institutions, for its advantage. Thus it is to the Lombards that we usually ascribe the invention and use of banks, book-keeping, exchanges, rechanges, &c.

It does not appear which of the European people, after the settlement of their new masters, first betook themselves to navigation and commerce. Some think it began with the French, although the Italians seem to have the justest title to this distinction, and are accordingly regarded as the restorers of navigation, as well as of the polite arts, which had been banished together from the time the empire was torn asunder. It is the people of Italy, then, and particularly those of Venice and Genoa, who have the glory of this restoration; and it is to their advantageous situation for navigation that they in great measure owe their glory. In the bottom of the Adriatic were a great number of marshy islands, only separated by narrow channels, but these well screened, and almost inaccessible, the residence of some fishermen, who here supported themselves by a little trade in fish and salt, which they found in some of these islands. Thither the Veneti, a people inhabiting that part of Italy which stretches along the coasts of the gulf, retired, when Alaric king of the Goths, and afterwards Attila king of the Huns, ravaged Italy.

These new islanders, little imagining that this was to be their fixed residence, did not think of composing any body politic; but each of the seventy-two islands of this little archipelago continued a long time under its separate master, and each formed a distinct commonwealth. When their commerce had become considerable enough to occasion jealousy to their neighbours, they began to think of uniting into a body; and it was this union, first begun in the sixth century, but not completed till the eighth, that laid the sure foundation of the future grandeur of the state of Venice. From the time of this union, their fleets of merchantmen were sent to all the ports of the Mediterranean; and at last to those of Egypt, particularly Cairo, a new city, built by the Saracen princes, on the eastern bank of the Nile, where they traded for the spices and other products of the Indies. Thus they flourished, and increased their commerce, their navigation, and their conquests, till the league of Cambray in 1508, when a number of jealous princes conspired to bring about their ruin; which was the more easily effected by the diminution of their East India commerce, of which the Portuguese had got one part and the French another.

Genoa, which had applied itself to navigation at the same time with Venice, and that with equal success, was a long time its dangerous rival, disputed with it the empire of the sea, and shared with it the trade of Egypt and other parts both of the east and west. But jealousy soon began to break out; and the two republics coming to an open rupture, there was almost continual war for three centuries before the superiority was ascertained, when, towards the end of the fourteenth century, the battle of Chioza ended the strife; the Genoese, who till then had usually the advantage, having now lost all, and the Venetians, almost become desperate, having, by one happy blow, beyond all expectation, secured to themselves the empire of the sea, and superiority in commerce.

About the same time that navigation was retrieved in the southern parts of Europe, a new society of merchants was formed in the north, which not only carried commerce to the greatest perfection of which it was capable till the discovery of the East and West Indies, but also formed a

History. new scheme of laws for its regulation, which still obtain under the name of Uses and Customs of the Sea.

This society is that famous league of the Hanse Towns, commonly supposed to have been instituted about the year 1164. See HANSE TOWNS. For the modern state of navigation in England, Holland, France, Spain, Portugal, &c. see the articles COMMERCE, COMPANY, &c.

We shall only add, that in examining the causes of commerce passing successively from the Venetians, Genoese, and Hanse Towns, to the Portuguese and Spaniards, and from these again to the English and Dutch, it may be established as a maxim, that the relation between commerce and navigation, or their union, is so intimate, that the fall of the one inevitably draws after it that of the other; and that they will always either flourish or decline together. Hence so many laws, ordinances, statutes, and edicts for its regulation; and hence particularly that celebrated act of navigation, which an eminent foreign author calls the *palladium* or *tutelar deity of the commerce of England*, which was long considered as the standing rule, not only of the British amongst themselves, but also as that of other nations with whom they trafficked.

The art of navigation has been exceedingly improved in modern times, both with regard to the form of the vessels themselves, and also with respect to the methods of working them. The use of rowers is now entirely superseded by the improvements made in the formation of the sails, rigging, &c. by which means ships can not only sail much faster than formerly, but can tack in any direction with the greatest facility. It is also very probable that the ancients were neither so well skilled in finding the latitudes, nor in steering their vessels in places of difficult navigation, as the moderns. But the greatest advantage which the moderns possess over the ancients consists in the mariner's compass, by which they are enabled to find their way with more facility in the midst of an immeasurable ocean, than the ancients could have done by creeping along the coast, and never going out of sight of land. Some people indeed contend that this is no new invention, but that the ancients were acquainted with it. They say, that it was impossible for Solomon to have sent ships to Ophir, Tarshish, and Parvaim, which last they imagine to have been Peru, without this useful instrument. They insist, that it was impossible for the ancients to be acquainted with the attractive virtue of the magnet, and to be ignorant of its polarity; nay, they affirm that this property of the magnet is plainly mentioned in the book of Job, where the loadstone is mentioned by the name of *topaz*, or *the stone that turns itself*. But it is certain that the Romans who conquered Judæa were ignorant of this instrument; and it is very improbable that such an useful invention, if it had once been commonly known to any nation, would have been forgotten, or perfectly concealed from such a prudent people as the Romans, who were so deeply interested in the discovery of it.

Amongst those who admit that the mariner's compass is a modern invention, it has been much disputed who was the inventor. Some attribute the honour of the discovery to Flavio Gioia of Amalfi in Campania,[1] who lived about the beginning of the fourteenth century; whilst others contend that it came from the east, and was earlier known in Europe. But, at whatever time it was invented, it is certain, that the mariner's compass was not commonly used in navigation before the year 1420. In that year the science was considerably improved under the auspices of Henry duke of Visco, brother to the king of Portugal. In the year 1485, Roderick and Joseph, physicians to John II. king of Portugal, together with one Martin de Bohemia, a Portuguese native of the island of Fayal, and scholar of Regiomontanus, calculated tables of the sun's declination for the use of sailors, and recommended the astrolabe for taking observations at sea. Of the instructions of Martin the celebrated Christopher Columbus is said to have availed himself, and to have improved the Spaniards in the knowledge of the art; for the farther progress of which a lecture was afterwards founded at Seville by the Emperor Charles V. History.

The discovery of the variation is claimed both by Columbus and by Sebastian Cabot. The former certainly did observe the variation without having heard of it from any other person, on the 14th of September 1492, and it is very probable that Cabot might have done the same. At that time it was found that there was no variation at the Azores, where some geographers have thought proper to place the first meridian, though it has since been observed that the variation alters in time. The use of the cross staff now began to be introduced amongst sailors. This ancient instrument is described by John Werner of Nuremberg, in his annotations on the first book of Ptolemy's Geography, printed in the year 1514. He recommends it for observing the distance between the moon and some star, in order thence to determine the longitude.

At this time the art of navigation was very imperfect, on account of the inaccuracies of the plane chart, which was the only one then known, and which, by its gross errors, must have greatly misled the mariner, especially in voyages far distant from the equator. Its precepts were probably at first only set down on the sea charts, as is the custom at this day; but at length two Spanish treatises were published in the year 1545, one by Pedro de Medina, and the other by Martin Cortes, which contained a complete system of the art, as far as it was then known. These seem to have been the oldest writers who fully handled the art; for Medina, in his dedication to Philip prince of Spain, laments that multitudes of ships daily perished at sea, because there were neither teachers of the art, nor books by which it might be learned; and Cortes, in his dedication, boasts to the emperor, that he was the first who had reduced navigation into a compendium, valuing himself much on what he had performed. Medina defended the plane chart; but he was opposed by Cortes, who showed its errors, and endeavoured to account for the variation of the compass, by supposing the needle to be influenced by a magnetic pole (which he called the *point attractive*), different from that of the world, which notion has been farther prosecuted by others. Medina's book was soon translated into Italian, French, and Flemish, and for a long time served as a guide to foreign navigators. However, Cortes was the favourite author of the English nation, and was translated in the year 1561; whilst Medina's work was entirely neglected, though translated also within a short time of the other. At that time the system of navigation consisted of an account of the Ptolemaic hypothesis, and the circles of the sphere; of the roundness of the earth, the longitudes, latitudes, climates, &c. and eclipses of the luminaries; a calendar; the method of finding the prime, epact, moon's age, and tides; a description of the compass, an account of its variation, for the discovering of which Cortes said that an instrument might easily be contrived; tables of the sun's declination for four years, in order to find the latitude from his meridian altitude; directions to find the same by certain stars; of the course of the sun and moon; the length of the days; of time and its divisions; the method of finding the hour of the day and night; and, lastly, a description of the sea chart, on which, in order to discover where the ship was, they made use of a small table, which showed, upon an alteration of one degree of the latitude, how many

[1] See the articles GIOIA and MAGNETISM.

History. leagues were run in each rhumb, together with the departure from the meridian. Besides, some other instruments were described, especially by Cortes; such as one to find the place and declination of the sun, with the days and place of the moon; certain dials, the astrolabe, and cross staff; together with a complex machine to discover the hour and latitude at once.

About the same time proposals were made for finding the longitude by observations of the moon. In 1530 Gemma Frisius advised the keeping of time by means of small clocks or watches, which were then, as he says, newly invented. He also contrived a new sort of cross staff, and an instrument called the *nautical quadrant*, which last was much praised by William Cunningham, in his Astronomical Glass, printed in the year 1559.

In the year 1537, Pedro Nunez, or Nonius, published a book in the Portuguese language, to explain a difficulty in navigation proposed to him by the commander Don Martin Alphonso de Susa. In this he exposed the errors of the plane chart, and likewise gave the solution of several curious astronomical problems, amongst which was that of determining the latitude from two observations of the sun's altitude and the intermediate azimuth. He observed, that although the rhumbs are spiral lines, yet the direct course of a ship will always be in the arc of a great circle, whereby the angle with the meridians will continually change; and hence all that the steersman can here do for the preserving of the original rhumb, is to correct these deviations as soon as they appear sensible. But in reality the ship will thus describe a course without the rhumb line intended; and therefore his calculations for assigning the latitude, where any rhumb line crosses the several meridians, will be in some measure erroneous. He invented a method of dividing a quadrant by means of concentric circles, which, after having been much improved by Dr Halley, is used at present, and is called a *nonius*.

In the year 1577, Mr William Bourne published a treatise, in which, by considering the irregularities in the moon's motion, he showed the error of the sailors in finding her age by the epact, and also in determining the hour from observing on what point of the compass the sun and moon appeared. He advised, in sailing towards the high latitudes, to keep the reckoning by the globe, as there the plane chart was most erroneous. He despaired of our ever being able to find the longitude, unless the variation of the compass should be occasioned by some such attractive point as Cortes had imagined, of which, however, he doubted; but as he had shown how to find the variation at all times, he recommended to keep an account of the observations, as useful for finding the place of the ship; and this advice was prosecuted at large by Simon Stevin, in a treatise published at Leyden in 1599, the substance of which was the same year printed at London in English by Mr Edward Wright, entitled the Haven-finding Art. In this ancient tract is also described the method by which our sailors estimate the rate of a ship in her course, by an instrument called the *log*. This was so named from the piece of wood or log which floats in the water, whilst the time is reckoned during which the line that is fastened to it is veering out. The author of this contrivance is not known, neither was it taken notice of till 1607, in an East India voyage published by Purchas; but from that time it became famous, and was much taken notice of by almost all writers on navigation in every country; and it still continues to be used as at first, although many attempts have been made to improve it, and contrivances proposed to supply its place, many of which have succeeded in quiet water, but proved useless in a stormy sea.

In the year 1581 Michael Coignet, a native of Antwerp, published a treatise, in which he animadverted on Medina. In this he showed, that as the rhumbs are spirals, making endless revolutions about the poles, numerous errors must arise from their being represented by straight lines on the sea charts; but although he hoped to find a remedy for these errors, he was of opinion that the proposals of Nonius were scarcely practicable, and therefore in a great measure useless. In treating of the sun's declination, he took notice of the gradual decrease in the obliquity of the ecliptic; he also described the cross staff with three transverse pieces, which he admitted were then in common use amongst the sailors. He likewise described some instruments of his own invention; but all of them are now laid aside, excepting perhaps his nocturnal. He constructed a sea table to be used by such as sailed beyond the sixtieth degree of latitude; and at the end of the book is delivered a method of sailing upon a parallel of latitude by means of a ring dial and a twenty-four hour glass. The same year the discovery of the dipping needle was made by Mr Robert Norman. In his publication on that subject he maintains, in opposition to Cortes, that the variation of the compass was caused by some point on the surface of the earth, and not in the heavens; and he also made considerable improvements on the construction of compasses themselves, showing especially the danger of not fixing, on account of the variation, the wire directly under the *fleur de lis*, as compasses made in different countries have it placed differently. To this performance of Norman's is prefixed a discourse on the variation of the magnetical needle, by Mr William Burrough, in which he shows how to determine the variation in many different ways, and also points out many errors in the practice of navigation at that time, speaking in very severe terms concerning those who had published upon it. History.

During this time the Spaniards continued to publish treatises on the art. In 1585 an excellent compendium was published by Roderico Zamorano, and contributed greatly towards the improvement of the art, particularly in the sea charts. Globes of an improved kind, and of a much larger size than those formerly used, were now constructed, and many improvements were made in other instruments; nevertheless, the plane chart continued still to be followed, though its errors were frequently complained of. Methods of removing these errors had indeed been sought after; and Gerard Mercator seems to have been the first who found the true method of effecting this, so as to answer the purposes of seamen. His method was to represent the parallels, both of latitude and longitude, by parallel straight lines, but gradually to augment the former as they approached the pole. Thus the rhumbs, which otherwise ought to have been curves, were now also extended into straight lines; and thus a straight line drawn between any two places marked upon the chart formed an angle with the meridians, expressing the rhumb leading from the one to the other. But although in 1569 Mercator published an universal map constructed in this manner, it does not appear that he was acquainted with the principles upon which this proceeded; and it is now generally believed, that the true principles on which the construction of what is called *Mercator's chart* depends were first discovered by an Englishman, Mr Edward Wright.

Mr Wright supposed, but, according to the general opinion, without sufficient grounds, that this enlargement of the degrees of latitude was known and mentioned by Ptolemy, and that the same thing had also been spoken of by Cortes. The expressions of Ptolemy alluded to relate indeed to the proportion between the distances of the parallels and meridians; but instead of proposing any gradual enlargement of the parallels of latitude in a general chart, he speaks only of particular maps, and advises not to confine a system of such maps to one and the same scale, but to plan them out by a different measure, as occasion might require; with this precaution, however, that the degrees of

History. longitude in each should bear some proportion to those of latitude, and this proportion was to be deduced from that which the magnitude of the respective parallels bore to a great circle of the sphere. He added, that, in particular maps, if this proportion be observed with regard to the middle parallel, the inconvenience will not be great, although the meridians should be straight lines parallel to each other. But here he is understood only to mean, that the maps should in some measure represent the figures of the countries for which they are drawn. In this sense Mercator, who drew maps for Ptolemy's tables, understood him; thinking it, however, an improvement not to regulate the meridians by one parallel, but by two, one distant from the northern, the other from the southern extremity of the map, by a fourth part of the whole depth; by which means, in his maps, although the meridians are straight lines, yet they are generally drawn inclining to each other towards the poles. With regard to Cortes, he speaks only of the number of degrees of latitude, and not of the extent of them; nay, he gives express directions that they should all be laid down by equal measurement in a scale of leagues adapted to the map.

For some time after the appearance of Mercator's map, it was not rightly understood, and it was even thought to be entirely useless, if not detrimental. However, about the year 1592 its utility began to be perceived; and seven years afterwards, Mr Wright printed his famous treatise entitled the Correction of certain Errors in Navigation, where he fully explained the reason of extending the length of the parallels of latitude, and the uses thereof to navigators. In 1610 a second edition of Mr Wright's book was published, with improvements. An excellent method was proposed of determining the magnitude of the earth; and at the same time it was judiciously proposed to make our common measures in some proportion to a degree on its surface, that they might not depend on the uncertain length of a barleycorn. Amongst his other improvements may be mentioned the Table of Latitudes for Dividing the Meridian computed to Minutes, whereas it had been only divided to every tenth minute. He also published a description of an instrument which he calls the *sea rings*, by which the variation of the compass, the altitude of the sun, and the time of the day, may at once readily be determined in any place, provided the latitude is known. He also showed how to correct the errors arising from the eccentricity of the eye in observing by the cross staff. In the years 1594, 1595, 1596, and 1597, he amended the tables of the declinations and places of the sun and stars from his own observations made with a six-feet quadrant, a sea quadrant to take altitudes by a forward or backward observation, and likewise with a contrivance for the ready finding of the latitude by the height of the pole star, when not upon the meridian. To this edition was subjoined a translation of Zamorano's Compendium, above mentioned, in which he corrected some mistakes in the original; adding a large table of the variation of the compass observed in different parts of the world, in order to show that it was not occasioned by any magnetical pole.

These improvements soon became known abroad. In 1608 a treatise entitled *Hypomnemata Mathematica* was published by Simon Stevin, for the use of Prince Maurice. In the portion of the work relating to navigation, the author having treated of sailing on a great circle, and shown how to draw the rhumbs on a globe mechanically, set down Wright's two tables of latitudes and of rhumbs, in order to describe these lines more accurately, pretending even to have discovered an error in Wright's table. But all Stevin's objections were fully answered by the author himself, who showed that they arose from the rude method of calculating made use of by the former. History.

In 1624 the learned Wellebrordus Snellius, professor of the mathematics at Leyden, published a treatise of navigation on Wright's plan, but somewhat obscurely; and as he did not particularly mention all the discoveries of Wright, the latter was thought by some to have taken the hint of all his discoveries from Snellius. But this supposition has been long ago refuted; and Wright now enjoys the honour of those discoveries, which is justly his due.

Mr Wright having shown how to find the place of the ship upon his chart, observed that the same might be performed more accurately by calculation; but considering, as he says, that the latitudes, and especially the courses at sea, could not be determined so precisely, he forbore setting down particular examples, as the mariner may be allowed to save himself this trouble, and only to mark out upon his chart the ship's way, after the manner then usually practised. However, in 1614, Mr Raphe Handson, amongst the nautical questions he subjoined to a translation of Pitiscus's Trigonometry, solved very distinctly every case of navigation, by applying arithmetical calculations to Wright's Table of Latitudes, or of Meridional Parts, as it has since been called. Although the method discovered by Wright for finding the change of longitude by a ship sailing on a rhumb is the proper way of performing it, Handson also proposes two methods of approximation without the assistance of Wright's division of the meridian line. The first was computed by the arithmetical mean between the cosines of both latitudes; and the other by the same mean between the secants as an alternative, when Wright's book was not at hand; although this latter is wider of the truth than the former. By the same calculations also he showed how much each of these compendiums deviates from the truth, and also how widely the computations on the erroneous principles of the plane chart differ from them all. The method generally used by our sailors, however, is commonly called the *middle latitude*, which, although it errs more than that by the arithmetical mean between the two cosines, is preferred on account of its being less operose; yet in high latitudes it is more eligible to use that of the arithmetical mean between the logarithmic cosines, equivalent to the geometrical mean between the cosines themselves; a method since proposed by Mr John Bassat. The computation by the middle latitude will always fall short of the true change of longitude, that by the geometrical mean will always exceed; but that by the arithmetical mean falls short in latitudes of about 45 degrees, and exceeds in lesser latitudes. However, none of these methods will differ much from the truth when the change of latitude is sufficiently small.

About this period logarithms were invented by John Napier, baron of Merchiston in Scotland, and proved of the utmost service to the art of navigation. From these Mr Edmund Gunter constructed a table of logarithmic sines and tangents to every minute of the quadrant, which he published in 1620. In this work he applied to navigation, and other branches of mathematics, his admirable ruler known by the name of Gunter's scale,[1] on which are described lines of logarithms, of logarithmic sines and tangents, of meridional parts, &c.; and he greatly improved the sector for the same purposes. He also showed how to take a back observation by the cross staff, by which the error arising from the eccentricity of the eye is avoided. He likewise described another instrument, of his own invention, called the *cross bow*, for taking altitudes of the sun or stars, with some contrivances for the more readily collecting the latitude from the observation. The discoveries concerning logarithms were carried into France in

[1] See Gunter's Scale.

History. 1624 by Mr Edmund Wingate, who published two small tracts in that year at Paris. In one of these he taught the use of Gunter's scale; and in the other, that of the tables of artificial sines and tangents, as modelled according to Napier's last form, erroneously attributed by Wingate to Briggs.

Gunter's rule was projected into a circular arch by the Reverend Mr William Oughtred in 1633, and its uses were fully shown in a pamphlet entitled the Circles of Proportion, where, in an appendix, several important points in navigation are well treated. It has also been made in the form of a sliding ruler.

The logarithmic tables were first applied to the different cases of sailing by Mr Thomas Addison, in his treatise entitled Arithmetical Navigation, printed in the year 1625. He also gave two traverse tables, with their uses; the one to quarter points of the compass, and the other to degrees. Mr Henry Gellibrand published his discovery of the changes of the variation of the compass, in a small quarto pamphlet, entitled a Discourse Mathematical on the Variation of the Magnetical Needle, printed in 1635. This extraordinary phenomenon he found out by comparing the observations which had been made at different times near the same place by Mr Burrough, Mr Gunter, and himself, all persons of great skill and experience in these matters. This discovery was likewise soon known abroad; for Athanasius Kircher, in his treatise entitled *Magnes*, first printed at Rome in the year 1641, informs us, that he had been told of it by Mr John Greaves, and then gives a letter of the famous Marinus Mersennus, containing a very distinct account of the same.

As altitudes of the sun are taken on shipboard by observing his elevation above the visible horizon, to obtain from these the sun's true altitude with correctness, Wright observed it to be necessary that the dip of the visible horizon below the horizontal plane passing through the observer's eye should be brought into the account, which cannot be calculated without knowing the magnitude of the earth. Hence he was induced to propose different methods for finding this; but he complains that the most effectual was out of his power to execute, and therefore he contented himself with a rude attempt, in some measure sufficient for his purpose. The dimensions of the earth deduced by him corresponded very well with the usual divisions of the log line; nevertheless, as he wrote not an express treatise on navigation, but only for the correcting such errors as prevailed in general practice, the log line did not fall under his notice. Mr Richard Norwood, however, put in execution the method recommended by Mr Wright as the most perfect for measuring the dimensions of the earth, with the true length of the degrees of a great circle upon it; and, in 1635, he actually measured the distance between London and York; from which measurement, and the summer solstitial altitudes of the sun observed on the meridian at both places, he found a degree on a great circle of the earth to contain 367,196 English feet, equal to 57,300 French fathoms or toises, which is very exact, as appears from many measurements that have been made since that time. Of all this Mr Norwood gave a full account in his treatise called the Seaman's Practice, published in 1637. He there showed the reason why Snellius had failed in his attempt; and he also pointed out various uses of his discovery, particularly for correcting the gross errors hitherto committed in the divisions of the log line. But necessary amendments have been little attended to by sailors, whose obstinacy in adhering to established errors has been complained of by the best writers on navigation. This improvement, however, has at length made its way into practice, and few navigators of reputation now make use of the old measure of forty-two feet to a knot. In this treatise Mr Norwood also describes his own excellent method of setting down and perfecting a sea reckoning, by using a traverse table, which method he had followed and taught for many years. He likewise shows how to rectify the course by the variation of the compass being considered; as also how to discover currents, and to make proper allowance on their account. This treatise, and another on trigonometry, were continually reprinted, as the principal books for learning scientifically the art of navigation. What he had delivered, especially in the latter of them, concerning this subject, was abridged as a manual for sailors, in a very small piece called an Epitome, which useful performance has gone through a great number of editions. No alterations were ever made in the Seaman's Practice till the twelfth edition in 1676, when the following paragraph was inserted in a smaller character: "About the year 1672, Monsieur Picart has published an account in French, concerning the measure of the earth, a breviate whereof may be seen in the Philosophical Transactions, No. 112, wherein he concludes one degree to contain 365,184 English feet, nearly agreeing with Mr Norwood's experiment;" and this advertisement is continued through the subsequent editions as late as the year 1732. History.

About the year 1645 Mr Bond published in Norwood's Epitome a very great improvement of Wright's method, from a property in his meridian line, whereby the divisions are more scientifically assigned than the author himself was able to effect; it resulted from this theorem, that these divisions are analogous to the excesses of the logarithmic tangents of half the respective latitudes augmented by forty-five degrees above the logarithm of the radius. This he afterwards explained more fully in the third edition of Gunter's works, printed in 1653, where he observed that the logarithmic tangents from 45° upwards increase in the same manner as the secants do added together, if every half degree be accounted as a whole degree of Mercator's meridional line. His rule for computing the meridional parts belonging to any two latitudes, supposed to be on the same side of the equator, is to the following effect: "Take the logarithmic tangent, rejecting the radius, of half each latitude, augmented by forty-five degrees; divide the difference of those numbers by the logarithmic tangent of 45° 30′, the radius being likewise rejected, and the quotient will be the meridional parts required, expressed in degrees." This rule is the immediate consequence of the general theorem, that the degrees of latitude bear to one degree (or sixty minutes, which in Wright's table stands for the meridional parts of one degree), the same proportion as the logarithmic tangent of half any latitude augmented by forty-five degrees, and the radius neglected, to the like tangent of half a degree augmented by forty-five degrees, with the radius likewise rejected. But here there was still wanting the demonstration of this general theorem, which was at length supplied by Mr James Gregory of Aberdeen, in his *Exercitationes Geometricæ*, printed at London in 1668; and afterwards more concisely demonstrated, together with a scientific determination of the divisor, by Dr Halley, in the Philosophical Transactions for 1695 (No. 219), from the consideration of the spirals into which the rhumbs are transformed in the stereographic projection of the sphere upon the plane of the equinoctial, and which is rendered still more simple by Mr Roger Cotes, in his *Logometria*, first published in the Philosophical Transactions for 1714 (No. 388). It is moreover added in Gunter's book, that if $\frac{1}{20}$th of this division, which does not sensibly differ from the logarithmic tangent of 45° 1′ 30″, with the radius subtracted from it, be used, the quotient will exhibit the meridional parts expressed in leagues, and this is the divisor set down in Norwood's Epitome. After the same manner the meridional parts will be found in minutes, if the like logarithmic tangent of 45° 1′ 30″, diminished by the radius, be

Theory. taken; that is, the number used by others being 12633, when the logarithmic tables consist of eight places of figures besides the index.

In an edition of a book called the Seaman's Kalendar, Mr Bond declared that he had discovered the longitude by having found out the true theory of the magnetic variation; and to gain credit to his assertion, he foretold, that at London in 1657 there would be no variation of the compass, and from that time it would gradually increase the other way; which happened accordingly. Again, in the Philosophical Transactions for 1668 (No. 40), he published a table of the variation for forty-nine years to come. Thus he acquired such reputation, that his treatise entitled The Longitude Found, was in the year 1676 published by the special command of Charles II. and approved by many celebrated mathematicians. It was not long, however, before it met with opposition; and in the year 1678, another treatise, entitled The Longitude not Found, made its appearance, and as Mr Bond's hypothesis did not in any manner answer its author's sanguine expectations, the affair was undertaken by Dr Halley. The result of his speculation was, that the magnetic needle is influenced by four poles; but this wonderful phenomenon seems hitherto to have eluded all our researches. (See MAGNETISM.) In 1700, however, Dr Halley published a general map, with curve lines expressing the paths where the magnetic needle had the same variation; which was received with universal applause. But as the positions of these curves vary from time to time, they should frequently be corrected by skilful persons, as was done in 1644 and 1756, by Mr William Mountaine, and Mr James Dodson. In the Philosophical Transactions for 1690, Dr Halley also gave a dissertation on the monsoons, containing many very useful observations for such as sail to places subject to these winds.

Theory. After the true principles of the art were settled by Wright, Bond, and Norwood, the authors who wrote on navigation became so numerous that it would be impossible to enumerate them. New improvements were daily made, and every thing relative to it was settled with an accuracy not only unknown to former ages, but which would have been reckoned utterly impossible. The earth being found to be a spheroid, and not a perfect sphere, with the shortest diameter passing through the poles, a tract was published in 1741 by the Reverend Doctor Patrick Murdoch, wherein he accommodated Wright's sailing to such a figure; and the same year Mr Colin Maclaurin, in the Philosophical Transactions (No. 461), gave a rule for determining the meridional parts of a spheroid; which speculation is farther treated of in his book of Fluxions, printed at Edinburgh in 1742, and in Delambre's Astronomy (t. iii. ch. xxxvi.).

Amongst the later discoveries in navigation, that of finding the longitude both by lunar observations and by time-keepers is the principal. It is owing chiefly to the rewards offered by the British parliament that this has attained the present degree of perfection. We are indebted to Dr Maskelyne for putting the first of these methods in practice, and for other important improvements in navigation. The time-keepers constructed by Harrison for this express purpose were found to answer so well that he obtained the parliamentary reward. These have been improved by Arnold, Earnshaw, and many others, so as now to be almost in common use.

The works which have latterly appeared on navigation are those on the longitude and navigation by Dr Mackay, Dr Inman, Mr Riddle, Mr Norie, and others, and which contain every necessary requisite to form the practical navigator.

THEORY OF NAVIGATION.

The motion of a ship in the water is well known to depend on the action of the wind upon its sails, regulated by the direction of the helm. As the water is a resisting medium, and the bulk of the ship very considerable, it thence follows that there is always a great resistance on her fore-part; and when this resistance becomes sufficient to balance the moving force of the wind upon the sails, the ship attains her utmost degree of velocity, and her motion is no longer accelerated. This velocity is different according to the different strength of the wind; but the stronger the wind, the greater resistance is made to the ship's passage through the water; and hence, although the wind should blow ever so strongly, there is also a limit to the velocity of the ship, for the sails and ropes can bear but a certain force of air; and when the resistance on the fore-part becomes more than equivalent to their strength, the velocity can no longer be increased, and the rigging gives way.

The direction of a ship's motion depends upon the position of her sails with regard to the wind, combined with the action of the rudder. The most natural direction of the ship is, when she runs directly before the wind, the sails being then disposed so as to be at right angles thereto. But this is not always the case, both on account of the variable nature of the winds, and the situation of the intended port, or of intermediate headlands or islands. When the wind, therefore, happens not to be favourable, the sails are placed so as to make an oblique angle both with the direction of the ship and with the wind; and the sails, together with the rudder, must be managed in such a manner that the direction of the ship may make an acute angle with that of the wind; and the ship, making boards on different tacks, will by this means arrive at the intended port.

The reason of the ship's motion in this case is, that the water resists the side more than the fore-part, and that in the same proportion as her length exceeds her breadth. This proportion is so considerable, that the ship continually flies off where the resistance is least, and that sometimes with great swiftness. In this way of sailing, however, there is a great limitation; for if the angle made by the keel with the direction of the wind be too acute, the ship cannot be kept in that position; neither is it possible for a large ship to make a more acute angle with the wind than about six points, though small sloops, it is said, may make an angle of about five points with it or less. In all these cases, however, the velocity of the ship is greatly retarded, and that not only on account of the obliquity of her motion, but by reason of what is called her *lee-way*. This is occasioned by the yielding of the water on the lee-side of the ship, by which means the vessel acquires a compound motion, partly in the direction of the wind, and partly in that which is necessary for attaining the desired port.

It is perhaps impossible to lay down any mathematical principles on which the lee-way of a ship could be properly calculated; only we may observe in general that it depends on the strength of the wind, the roughness of the sea, and the velocity of the ship. When the wind is not very strong, the resistance of the water on the lee-side bears a very great proportion to that of the current of air, and therefore it will yield but very little; however, supposing the ship to remain in the same place, it is evident, that the water having once begun to yield, will continue to do so for some time, even though no additional force were applied to it; but as the wind continually applies the same force as at first, the lee-way of the ship must go on constantly increasing till the resistance of the water upon the lee-side balances the force applied on the other, when it will become uniform, as does the motion of a ship sailing

Mariner's Compass.

before the wind. If the ship change her place with any degree of velocity, then every time she moves her own length, a new quantity of water is to be put in motion, which has not yet received any momentum, and which of consequence will make a greater resistance than it can do when the ship remains in the same place. In proportion to the swiftness of the ship, then, the lee-way will be the less; but if the wind be very strong, the velocity of the ship will bear but a small proportion to that of the current of air, and the same effects must follow as though the ship moved slowly and the wind was gentle, that is, the ship must make a great deal of lee-way. The same thing happens when the sea rises high, whether the wind be strong or not; for then the whole water of the ocean, as far as the swell reaches, has acquired a motion in a certain direction, and that to a very considerable depth. The mountainous waves will not fail to carry the ship very much out of her course; and this deviation will certainly be according to their velocity and their magnitude. In all cases of a rough sea, therefore, a great deal of lee-way is made. Another circumstance also occasions a variation in the quantity of the lee-way, namely, the lightness or heaviness of the ship; it being evident, that when the ship sinks deep in the water, a much greater quantity of that element is to be put in motion before she can make any lee-way, than when she swims on the surface. As, therefore, it is impossible to calculate all these things with mathematical exactness, it is plain that the real course of a ship is exceedingly difficult to be found, and frequent errors must occur, which can only be corrected by means of celestial observations.

In many places of the ocean there are *currents*, or places where the water, instead of remaining at rest, runs with a very considerable velocity for a considerable way in some particular direction, and which will certainly carry the ship greatly out of her course. This occasions an error of the same nature with the lee-way; and therefore, whenever a current is perceived, its direction and velocity ought to be determined, and the proper allowances made.

Another source of error in reckoning the course of a ship proceeds from the variation of the compass. There are few parts of the world where the needle points exactly north; and in those where the variation is known, it is subject to very considerable alterations. By these means the course of the ship is mistaken; for as the sailors have no other standard to direct them than the compass, if the needle, instead of pointing due north, should point north-east, a prodigious error would be occasioned during the course of the voyage, and the ship would not come near the port to which she was bound. To avoid errors of this kind, the only method is to observe the sun's amplitude and azimuth as frequently as possible, by which the variation of the compass will be perceived, and the proper allowances can then be made for errors in the course which this may have occasioned.

Errors will arise in the reckoning of a ship, especially when she sails in high latitudes, from the spheroidal figure of the earth; for as the polar diameter of our globe is found to be considerably shorter than the equatorial one, it thence follows, that the farther we remove from the equator, the longer are the degrees of latitude. Of consequence, if a navigator assigns any certain number of miles for the length of a degree of latitude near the equator, he must vary that measure as he approaches towards the poles, otherwise he will imagine that he has not sailed so far as he has actually done. It would therefore be necessary to have a table containing the length of a degree of latitude in every different parallel from the equator to either pole; as, without this, a troublesome calculation must be made at every time the navigator makes a reckoning of his course. Such a table, however, has not yet appeared; neither indeed does it seem to be an easy matter to make it, on account of the difficulty of measuring the length even of one or two degrees of latitude in different parts of the world. Sir Isaac Newton first discovered this spheroidal figure of the earth; and showed, from theory originally suggested by experiments on pendulums, that the polar diameter was to the equatorial one as 229 to 230. This proportion, however, has not been admitted by succeeding calculators. The French mathematicians, who measured a degree of the meridian in Lapland, made the proportion between the equatorial and polar diameters to be as 1 to 0·9891; those who measured a degree at Quito in Peru made the proportion as 1 to 0·99624, or 266 to 265; M. Bouguer makes the proportion to be as 179 to 178; and M. Buffon, in one part of his theory of the earth, makes the equatorial diameter exceed the polar one by $\frac{1}{163}$th of the whole. According to M. du Sejour, this proportion is as 321 to 320; and M. de Laplace, in his Memoir upon the Figure of Spheroids, has deduced the same proportion. Later investigations, however, show that the polar axis is to the equatorial diameter in the ratio of 300 to 301 nearly. From these variations, it appears that the point is not exactly determined, and, consequently, that any corrections which can be made with regard to the spheroidal figure of the earth must be very uncertain.

Mariner's Compass.

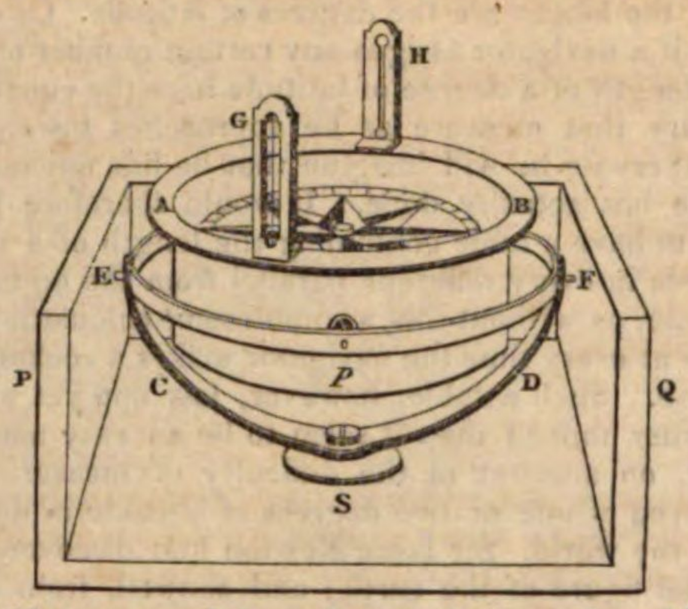
It is of consequence to navigators, in a long voyage, to take the nearest way to their port; but this is scarcely possible to be done. The shortest distance between any two points on the surface of a sphere is measured by an arc of a great circle intercepted between them; and therefore it is advisable to direct the ship along a great circle of the earth's surface. But this is a matter of considerable difficulty, because there are no fixed marks by which it can be readily known whether the ship sails in the direction of a great circle or not. For this reason the sailors commonly choose to direct their course by the rhumbs, or the bearing of the place by the compass. These bearings do not point out the shortest distance between places; because, upon a globe, the rhumbs are spirals, and not arcs of great circles. However, when the places lie directly under the equator, or exactly under the same meridian, the rhumb then coincides with the arc of a great circle, and of consequence shows the nearest way. The sailing on the arc of a great circle is called *great circle sailing*; and the cases of it depend all upon the solution of problems in spherical trigonometry.

MARINER'S COMPASS.

A ship is enabled to keep her course at sea by means of an instrument called the mariner's compass. It consists of a magnetic steel bar attached to the under side of a card divided into points and quarter points, and supported by a fine pin, on which it turns freely within a box covered with glass. By reason of the directive property of the magnet, the north point, which is commonly denoted by a *fleur de lis*, is readily known. The circumference of the card is generally divided into thirty-two points, which in the best compasses are again subdivided into half points and quarters. These are reckoned sufficient for nautical purposes. On the inside of the box is drawn a dark vertical line called lubber's point. This point, or rather line, and the pin on which the card turns, are in the same line or plane with the keel of the ship; and hence the point on the circumference of the card opposite to lubber's point shows the angle which the ship's course makes with the magnetic meridian, called the course of the ship.

Prelimi-nary Principles.

The annexed diagram gives a general view of the compass. The names of the points, and the angles which they



form with the meridian, are given in Table I. at the end of this article, and, as thus described, the instrument is called the steering compass.

Prelimi-nary Principles.

The azimuth compass is the same instrument more nicely made. The circumference of the card is divided into degrees and parts by a vernier, and is fitted up with sight-vanes to take amplitudes and azimuths, for the purpose of determining the variation of the compass by observation. The variation is then applied to the magnetic course shown by the steering compass, whence the true course with respect to the meridian becomes known. The necessary rules for this purpose will be given in a succeeding part of this article.

Besides the variation, the needle is also affected by the dip, which is likewise fully explained in the article MAGNETISM, as well as Mr Barlow's method of correcting the effects of local attraction, arising from the effects of the iron, guns, &c. in the vessel itself. Having made these preliminary observations, we shall now proceed to the

PRACTICE OF NAVIGATION.

BOOK I.

CONTAINING THE VARIOUS METHODS OF SAILING.

The art of navigation depends upon astronomical and mathematical principles. The places of the sun, moon, planets, and fixed stars, are deduced from observation and calculation, and arranged in tables, the use of which is absolutely necessary in reducing observations taken at sea for the purpose of ascertaining the latitude and longitude of the ship, and the variation of the compass. The problems in the various sailings are resolved either by trigonometrical calculation, or by tables or rules formed by the assistance of trigonometry. By mathematics, the necessary tables are constructed, and rules investigated for performing the more difficult parts of navigation. For these several branches of science, and for logarithmic tables, the reader is referred to the respective articles in this work. A few tables are given at the end of this article; but as the other tables necessary for the practice of navigation are to be found in almost every treatise on that subject, it seems unnecessary to insert them in this place.

CHAP. I.—PRELIMINARY PRINCIPLES.

SECT. I.—*Of the Latitude and Longitude of a Place.*

The situation of a place on the surface of the earth is estimated by its distance from two imaginary lines intersecting each other at right angles. The one of these is called the *equator*, and the other the *first meridian*. The situation of the equator is fixed; but that of the first meridian is arbitrary, and therefore different nations assume different first meridians. In Great Britain, we esteem that to be the first meridian which passes through the Royal Observatory at Greenwich.

The equator divides the earth into two equal parts, called the *northern* and *southern hemispheres*; and the latitude of a place is its distance from the equator, reckoned on a meridian in degrees and parts of a degree, being either north and south, according as it is in the northern or southern hemisphere.

The first meridian being continued round the globe, divides it into two equal parts, called the *eastern* and *western hemispheres*; and the longitude of a place is that portion of the equator contained between the first meridian and the meridian of the given place, and is either east or west, according as it is in the eastern or western hemisphere respectively to the first meridian.

PROB. I. The latitudes of two places being given, to find the difference of latitude.

RULE. Subtract the less latitude from the greater, if the latitudes be of the same name, but add them if of contrary; and the remainder or sum will be the difference of latitude.

Example 1. Required the difference of latitude between the Lizard, in latitude 49° 58′ N. and Cape St Vincent, in latitude 37° 3′ N.

Latitude of the Lizard,	.	49° 58′ N.
Latitude of Cape St Vincent,		37 3 N.
Difference of latitude,	.	12 55 = 775 miles.

Ex. 2. What is the difference of latitude between Funchal, in latitude 32° 38′ N., and the Cape of Good Hope, in latitude 34° 29′ S.?

Latitude of Funchal,	.	32° 38′ N.
Latitude of Cape of Good Hope,		34 29 S.
Difference of latitude,	.	67 7 = 4027 miles.

PROB. II. Given the latitude of one place, and the difference of latitude between it and another place; to find the latitude of that place.

RULE. If the given latitude and the difference of latitude be of the same name, add them; but if of different names, subtract them, and the sum or remainder will be the latitude required of the same name with the greater.

Ex. 1. A ship from latitude 39° 22′ N. sailed due north 560 miles. Required the latitude come to.

Latitude sailed from,	. .	39° 22′ N.
Difference of latitude 560′,	. .	= 9 20 N.
Latitude come to,	. .	48 42 N.

Ex. 2. A ship from latitude 7° 19′ N. sailed 854 miles south. Required the latitude come to.

Latitude sailed from,	. .	7° 19′ N.
Difference of latitude 854′,	.	= 14 14 S.
Latitude come to,	. . .	6 55 S.

PROB. III. The longitudes of two places being given, to find their difference of longitude.

RULE. If the longitudes of the given places are of the same name, subtract the less from the greater, and the remainder is the difference of longitude; but if the longitudes are of contrary names, their sum is the difference of longitude. If this exceeds 180°, subtract it from 360°, and the remainder is the difference of longitude.

Prelimi-nary Prin-ciples.

Ex. 1. Required the difference of longitude between Edinburgh and New York, their longitudes being 3° 12′ W. and 74° 2′ W. respectively.

Longitude of New York,	74°	2′ W.
Longitude of Edinburgh,	3	12 W.
Difference of longitude,	70	50

Ex. 2. What is the difference of longitude between Maskelyne's Isles, in longitude 167° 59′ E. and Olinda, in longitude 34° 54′ W.

Longitude of Maskelyne's Isles,	167°	59′ E.
Longitude of Olinda,	35	54 W.
Sum,	203	53
Subtract from,	360	0
Difference of longitude,	156	2

Prob. IV. Given the longitude of a place, and the difference of longitude between it and another place, to find the longitude of the latter place.

Rule. If the given longitude and the difference of longitude be of a contrary name, subtract the less from the greater, and the remainder is the longitude required, of the same name with the greater quantity; but if they are of the same name, add them, and the sum is the longitude sought, of the same name with that given. If this sum exceeds 180°, subtract it from 360°; the remainder is the required longitude, of a contrary name to that given.

Ex. 1. A ship from longitude 9° 54′ E. sailed westerly till the difference of longitude was 23° 18′. Required the longitude come to.

Longitude sailed from,	9° 54′	E.
Difference of longitude,	23 18	W.
Longitude come to,	13 24	W.

Prelimi-nary Prin-ciples.

Ex. 2. The longitude sailed from is 25° 9′ W. and difference of longitude 18° 46′. W. Required the longitude come to.

Longitude left,	25°	9′ W.
Difference of longitude,	18	46 W.
Longitude in,	43	55 W.

Sect. II.—*Of the Tides.*

The theory of the tides has already been explained under the article Astronomy, and will again be further illustrated under that of Tides. In this place, therefore, it remains only to explain the method of calculating the time of high water at a given place.

As the tides depend upon the joint actions of the sun and moon, and therefore upon the distance of these objects from the earth and from each other; and as, in the method generally employed to find the time of high water, whether by the mean time of new moon, or by the epacts, or tables deduced therefrom, the moon is supposed to be the sole agent, and to have an uniform motion in the periphery of a circle, whose centre is that of the earth; it is hence obvious that this method cannot be accurate, and by observation the error is sometimes found to exceed two hours. This method is therefore rejected, and another given, in which the error will seldom exceed a few minutes, unless the tides are greatly influenced by the winds.

Table I.—*For determining the Time of High Water.*

Moon's Transit.	Moon's Horizontal Parallax.																
	60′	59′	58′	57′	56′	55′	54′	Moon's Transit.	Moon's Transit.	60′	59′	58′	57′	56′	55′	54′	Moon's Transit.
h. m.	m.	m.	m.	m.	m.	m.	m.	h. m.	h. m.	m.	m.	m.	m.	m.	m.	m.	h. m.
0 0	— 4	— 3	— 2	— 0	+ 2	+ 4	+ 6	12 0	4 0	— 55	— 57	— 59	— 62	— 65	— 69	— 72	16 0
10	6	5	4	3	— 1	+ 1	+ 2	10	10	56	58	61	63	66	70	73	10
20	8	7	6	5	4	— 3	— 1	20	20	57	60	63	65	68	72	75	20
30	10	10	9	8	7	6	5	30	30	58	61	64	66	69	73	76	30
40	12	12	11	10	10	9	8	40	40	59	62	65	67	70	74	78	40
50	15	14	14	13	12	12	11	50	50	60	62	65	67	70	75	79	50
1 0	17	17	16	16	16	15	15	13 0	5 0	60	63	66	68	71	75	79	17 0
10	20	20	19	19	19	19	18	10	10	60	63	66	68	72	76	80	10
20	22	22	22	22	22	22	22	20	20	60	63	66	68	71	75	80	20
30	24	24	25	25	25	25	25	30	30	59	62	65	67	70	74	78	30
40	27	27	28	28	28	29	29	40	40	58	61	63	65	68	72	76	40
50	29	30	31	31	31	32	33	50	50	57	60	62	65	68	71	74	50
2 0	31	32	33	33	34	35	36	14 0	6 0	56	58	60	62	65	69	72	18 0
10	34	35	36	36	37	38	39	10	10	52	54	56	59	62	65	68	10
20	36	37	38	39	40	42	43	20	20	49	51	53	55	58	60	63	20
30	38	39	40	41	42	44	46	30	30	46	48	50	51	54	56	58	30
40	40	41	43	44	46	48	50	40	40	43	44	45	47	49	51	53	40
50	42	43	45	46	48	50	52	50	50	38	39	40	41	43	44	45	50
3 0	44	45	47	49	51	53	55	15 0	7 0	32	33	33	34	35	36	37	19 0
10	46	47	49	51	54	56	58	10	10	27	27	28	28	29	29	30	10
20	48	49	51	53	56	58	61	20	20	22	22	22	22	22	22	22	20
30	50	52	54	56	58	61	64	30	30	18	18	17	16	16	15	14	30
40	52	54	56	58	61	64	67	40	40	11	11	10	10	8	7	6	40
50	53	55	57	60	63	66	69	50	50	6	6	5	4	2	0	+ 1	50
4 0	— 55	— 57	— 59	— 62	— 65	— 69	— 72	16 0	8 0	— 1	+ 1	+ 2	+ 3	+ 5	+ 7	+ 9	20 0

Preliminary Principles.

TABLE I.—(*continued*).

Moon's Transit.	Moon's Horizontal Parallax. 60′	59′	58′	57′	56′	55′	54′	Moon's Transit.	Moon's Transit.	60′	59′	58′	57′	56′	55′	54′	Moon's Transit.
h. m.	m.	m.	m.	m.	m.	m.	m.	h. m.	h. m.	m.	m.	m.	m.	m.	m.	m.	h. m.
8 0	— 1	+ 1	+ 2	+ 3	+ 5	+ 7	+ 9	20 0	10 0	+ 15	+ 17	+ 20	+23	+ 27	+ 30	+ 34	22 0
10	+ 2	4	5	7	9	12	14	10	10	14	17	20	22	25	29	32	10
20	5	7	9	11	14	16	19	20	20	13	16	18	20	23	27	31	20
30	8	10	12	15	18	21	24	30	30	12	15	17	19	22	26	30	30
40	11	13	16	18	21	25	28	40	40	11	13	16	18	21	25	28	40
50	13	16	18	20	23	27	30	50	50	9	11	14	16	19	22	25	50
9 0	14	17	19	21	24	28	32	21 0	11 0	7	9	12	14	17	20	23	23 0
10	15	18	20	23	26	30	34	10	10	6	8	10	12	15	17	20	10
20	17	19	22	25	28	32	36	20	20	4	6	7	9	11	14	17	20
30	16	18	21	24	27	31	35	30	30	2	4	6	7	9	12	14	30
40	16	18	21	24	27	31	35	40	40	0	2	4	5	7	9	11	40
50	16	18	21	23	27	30	34	50	50	— 2	— 1	1	2	4	6	8	50
10 0	+ 15	+ 17	+ 20	+ 23	+ 27	+ 30	+ 34	22 0	12 0	— 1	— 1	+ 0	+ 0	+ 2	+ 4	+ 6	24 0

Preliminary Principles.

TABLE II.—*For finding the Height of the Tide.*

Time of Transit.		(PART I.) Moon's Hor. Par. 60′. Multipliers.	Moon's Hor. Par. 57′. Multipliers.	Moon's Hor. Par. 54′. Multipliers.	(PART II.) Time from H.W.	Mult.	Time from H.W.	Mult.
h. m.	h. m.				h. m.		h. m.	
0 0	12 0	0·995*a* + 0·149*b*	0·883*a* + 0·117*b*	0·795*a* + 0·082*b*	0 0	1·000	3 10	0·510
0 40	12 40	1·104*a* + 0·038*b*	0·970*a* + 0·030*b*	0·874*a* + 0·021*b*	0 10	0·998	3 20	0·460
1 20	13 20	1·138*a* + 0·000*b*	1·000*a* + 0·000*b*	0·901*a* + 0·000*b*	0 20	0·993	3 30	0·429
2 0	14 0	1·104*a* + 0·038*b*	0·970*a* + 0·030*b*	0·874*a* + 0·021*b*	0 30	0·985	3 40	0·389
2 40	14 40	0·995*a* + 0·149*b*	0·883*a* + 0·117*b*	0·795*a* + 0·082*b*	0 40	0·974	3 50	0·349
3 20	15 20	0·853*a* + 0·319*b*	0·750*a* + 0·250*b*	0·676*a* + 0·176*b*	0 50	0·959	4 0	0·311
4 0	16 0	0·668*a* + 0·527*b*	0·587*a* + 0·413*b*	0·529*a* + 0·290*b*	1 0	0·941	4 10	0·274
4 40	16 40	0·460*a* + 0·749*b*	0·413*a* + 0·587*b*	0·372*a* + 0·412*b*	1 10	0·921	4 20	0·238
5 20	17 20	0·284*a* + 0·958*b*	0·250*a* + 0·750*b*	0·225*a* + 0·527*b*	1 20	0·897	4 30	0·204
6 0	18 0	0·133*a* + 1·127*b*	0·117*a* + 0·883*b*	0·105*a* + 0·621*b*	1 30	0·871	4 40	0·173
6 40	18 40	0·034*a* + 1·238*b*	0·030*a* + 0·970*b*	0·027*a* + 0·682*b*	1 40	0·843	4 50	0·143
7 20	19 20	0·000*a* + 1·277*b*	0·000*a* + 1·000*b*	0·000*a* + 0·703*b*	1 50	0·812	5 0	0·116
8 0	20 0	0·034*a* + 1·238*b*	0·030*a* + 0·970*b*	0·027*a* + 0·682*b*	2 0	0·779	5 10	0·091
8 40	20 40	0·133*a* + 1·127*b*	0·117*a* + 0·883*b*	0·105*a* + 0·621*b*	2 10	0·774	5 20	0·069
9 20	21 20	0·284*a* + 0·958*b*	0·250*a* + 0·750*b*	0·225*a* + 0·527*b*	2 20	0·708	5 30	0·050
10 0	22 0	0·460*a* + 0·749*b*	0·413*a* + 0·587*b*	0·372*a* + 0·412*b*	2 30	0·670	5 40	0·033
10 40	22 40	0·668*a* + 0·527*b*	0·587*a* + 0·413*b*	0·529*a* + 0·290*b*	2 40	0·631	5 50	0·020
11 20	23 20	0·853*a* + 0·319*b*	0·750*a* + 0·250*b*	0·676*a* + 0·176*b*	2 50	0·591	6 0	0·010
12 0	24 0	0·995*a* + 0·149*b*	0·883*a* + 0·117*b*	0·795*a* + 0·082*b*	3 0	0·551	6 20	0·000

To find the time of High Water.

RULE. Let the approximate time of high water be found, by taking the corrections for the moon's horizontal parallax for the nearest noon or midnight from Table I. Again, to this time and the given longitude take from the Nautical Almanack the moon's horizontal parallax. Also to the time of the moon's transit over the meridian of Greenwich apply the variation answering to the longitude and daily variation between the given and preceding day if the longitude is east. Subtract it from the transit over the meridian of Greenwich, and the remainder will be the time of transit over the meridian of the given place. But if the longitude be west, the correction answering to the longitude and daily variation of transit between the given and following day must be added to the time of transit over the meridian of Greenwich to obtain the time of transit over the meridian of the given place. To the time of high water, if new and full moon at the given place, add the reduced time of transit over the meridian of the same place, and to the sum apply the equation from the table answering to the time of transit and horizontal parallax formerly found: the result will be the true mean time of high water required. The apparent time may be found by applying the equation of time, with its proper sign.

Ex. 1. Required the time of high water at Leith on Wednesday the 10th of May 1837, in longitude 3° 11′ W.

By the rule, the time of high water will be about six o'clock in the evening. In this case, the moon's horizontal parallax will be 54′ 16″, and the time of transit $4^h\ 50^m$ mean time, or $4^h\ 54^m$ apparent time by applying the equation of time $3^m\ 50^s$ by addition.

Apparent time of transit of upper meridian,		$4^h\ 54^m$
Equation from the table to horizontal parallax 54′ 16″, and transit $4^h\ 54^m$, subtract .	—	1 18
Remainder, ...		3 36
Time of high water at new and full moon,	+	2 20
Apparent time of high water, . .		5 56
Equation of time, subtract . .	—	0 4
Mean time of high water, . .		5 52

Preliminary Principles.

If the sum exceed $12^h\ 25^m$, subtract this number from it; if it exceed $24^h\ 50^m$, subtract as before, and the remainder will be the time of high water in the afternoon of the given day nearly. The time of high water of the tide preceding may be found nearly by subtracting 25^m from it, and the succeeding tide by adding 25^m to it. In cases of great accuracy, however, a computation should be made for each tide in a manner similar to that above.

Ex. 2. Required the time of high water at Aberdeen on the 21st of June 1837, in longitude 2° 6′ W.

As before, the time of high water will readily be found to be about three o'clock.

Here the horizontal parallax of the moon will be 60′ 30″, and the mean time of transit on the given day $15_h\ 32^m$. But as this transit exceeds 12^h, it will be necessary to take the time of transit over the under meridian, or, what comes to the same thing, half the sum of the transits on the given and preceding days, or $\frac{1}{2}(14^h\ 32^m + 15^h\ 32^m)$, ... $= 15^h\ 2^m$

Correction from the table, . . .	—	0 44
Remainder, ...		14 18
High water at new and full moon, .	+	1 10
Sum exceeding 12^h		15 28
By rule, subtract		12 25
Apparent time of high water, . .		3 3
Equation of time, ...	+	0 1
Mean time, ...		3 4

Ex. 3. Required the depth at Aberdeen at the same time, the rise of spring tides being 19 feet, denoted by *a* in Table II. part 1, and that of the neap 14 feet, by *b*.

Now, by Table II. part 1, to transit $15^h\ 2^m$, and horizontal parallax 60′ 30″, will be obtained $0{\cdot}917 \times 19 + 0{\cdot}242 \times 14 = 20{\cdot}8$ feet.

Ex. 4. Required the height of the tide at $3^h\ 15^m$ after high water.

By part 2, $20{\cdot}8 \times 0{\cdot}5 =$ . . . 10·4 feet.

In this manner, the time and rise of the tide may be readily obtained nearly, unless both are much influenced by the strength and direction of the wind.

SECT. III.—*Of measuring a Ship's Run in a given Time.*

The method commonly used at sea to find the distance sailed in a given time is by means of a log-line and half-minute glass. A description of these is given under the articles LOG and LOG-LINE, which see.

It has been already observed, that the interval between each knot on the line ought to be fifty feet, in order to adapt it to a glass that runs thirty seconds. But although the line and glass be at any time perfectly adjusted to each other, yet as the line shrinks after being wet, and as the weather has a considerable effect upon the glass, it will therefore be necessary to examine them from time to time; and the distance given by them must be corrected accordingly. The distance sailed may, therefore, be affected by an error in the glass, or in the line, or in both. The true distance may, however, be found as follows:

PROB. I. The distance sailed by the log, and the seconds run by the glass, being given, to find the true distance, the line being supposed right.

RULE. Multiply the distance given by the log by 30, and divide the product by the seconds run by the glass, the quotient will be the true distance.

Ex. 1. The hourly rate of sailing by the log is nine knots, and the glass is found to run out in 35 seconds. Required the true rate of sailing.

9
30

35)270(7·7 = true rate of sailing.

Plane Sailing.

Ex. 2. The distance sailed by the log is 73 miles, and the glass runs out in 26 seconds. Sought the true distance.

73
30

26)2190(84·2 the true distance.

PROB. II. Given the distance sailed by the log, and the measured interval between two adjacent knots on the line; to find the true distance, the glass running exactly 30 seconds.

RULE. Multiply twice the distance sailed by the measured length of a knot, point off two figures to the right, and the remainder will be the true distance.

Ex. 1. The hourly rate of sailing by the log is five knots, and the interval between knot and knot measures 53 feet. Required the true rate of sailing.

Measured interval,	=	53
Twice hourly rate,	=	10
True rate of sailing,	=	5·30

Ex. 2. The distance sailed is 64 miles, by a log-line which measures 42 feet to a knot. Required the true distance.

Twice given distance,	=	128
Measured interval, .		42
		256
		512
True distance, .		53·76

PROB. III. Given the length of a knot, the number of seconds run by the glass in half a minute, and the distance sailed by the log; to find the true distance.

RULE. Multiply the distance sailed by the log by six times the measured length of a knot, and divide the product by the seconds run by the glass; the quotient, pointing off one figure to the right, will be the true distance.

Ex. The distance sailed by the log is 159 miles, the measured length of a knot is 42 feet, and the glass runs 33 seconds in half a minute. Required the true distance.

Distance by the log, . . 159
Six times length of a knot = 42 × 6 = 252
318
795
318

Seconds run by the glass, = 33)40068(121·4 = true distance.

CHAP. II.—OF PLANE SAILING.

Plane sailing is the art of navigating a ship upon principles deduced from the notion of the earth's being an extended plane. On this supposition the meridians are esteemed as parallel right lines. The parallels of latitude are at right angles to the meridians; the lengths of the degrees on the meridians, equator, and parallels of latitude, are everywhere equal; and the degrees of longitude are reckoned on the parallels of latitude as well as on the equator. In this sailing four things are principally concerned, namely, the *course*, *distance*, *difference of latitude*, and *departure*.

The course is the angle contained between the meridian and the line described by the ship, and is usually expressed in points of the compass.

The distance is the number of miles a ship has sailed on a direct course in a given time.

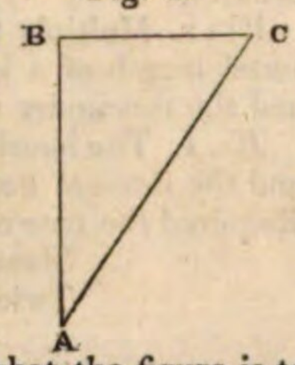
Plane Sailing.

The difference of latitude is the portion of a meridian contained between the parallels of latitude sailed from and come to; and is reckoned either north or south, according as the course is in the northern or southern hemisphere.

The departure is the distance of the ship from the meridian of the place she left, reckoned on a parallel of latitude. In this sailing, the departure and difference of longitude are esteemed equal.

In order to illustrate the above, let A represent the position of any given place, and AB the meridian passing through that place; also let AC represent the line described by a ship, and C the point arrived at. From C draw CB perpendicular to AB. Now in the triangle ABC, the angle BAC represents the course, the side AC the distance, AB the difference of latitude, and BC the departure.

Fig. 1.



In constructing a figure relating to a ship's course, let the upper part of what the figure is to be drawn on represent the *north*, then the lower part will be *south*, the right-hand side *east*, and the left-hand side *west*.

A north and south line is to be drawn to represent the meridian of the place from which the ship sailed; and the upper or lower part of this line, according as the course is southerly or northerly, is to be marked as the position of that place. From this point as a centre, with the chord of 60°, an arch is to be described from the meridian towards the right or left, according as the course is easterly or westerly; and the course, taken from the line of chords if given in degrees, but from the line of rhumbs if expressed in points of the compass, is to be laid upon this arch, beginning at the meridian. A line drawn through this point and that sailed from will represent the distance, which, if given, must be laid thereon, beginning at the point sailed from. A line is to be drawn from the extremity of the distance perpendicular to the meridian; and hence the difference of latitude and departure will be obtained.

Plane Sailing.

If the difference of latitude is given, it is to be laid upon the meridian, beginning at the point representing the place the ship left; and a line drawn from the extremity of the difference of latitude perpendicular to the meridian, till it meets the distance produced, will limit the figure.

If the departure is given, it is to be laid off on a parallel, and a line drawn through its extremity will limit the distance. When either the distance and difference of latitude, distance and departure, or difference of latitude and departure, are given, the measure of each is to be taken from a scale of equal parts, and laid off on its respective line, and the extremities connected. Hence the figure will be formed.

TABLE III.—*To reduce Points of the Compass to Degrees, and conversely.*

North-east Quadrant.	South-east Quadrant.	Points.	D.	M.	S.	South-west Quadrant.	North-west Quadrant.
North.	South.	0 0	0	0	0	South.	North.
N. ¼ E.	S. ¼ E.	0 ¼	2	48	45	S. ¼ W.	N. ¼ W.
N. ½ E.	S. ½ E.	0 ½	5	37	30	S. ½ W.	N. ½ W.
N. ¾ N.	S. ¾ E.	0 ¾	8	26	15	S. ¾ W.	N. ¾ W.
N. *by* E.	S. *by* E.	1 0	11	15	0	S. *by* W.	N. *by* W.
N. *by* E. ¼ E.	S. *by* E. ¼ E.	1 ¼	14	3	45	S. *by* W. ¼ W.	N. *by* W. ¼ W.
N. *by* E. ½ E.	S. *by* E. ½ E.	1 ½	16	52	30	S. *by* W. ½ W.	N. *by* W. ½ W.
N. *by* E. ¾ E.	S. *by* E. ¾ E.	1 ¾	19	41	15	S. *by* W. ¾ W.	N. *by* W. ¾ W.
N. N. E.	S. S. E.	2 0	22	30	0	S. S. W.	N. N. W.
N. N. E. ¼ E.	S. S. E. ¼ E.	2 ¼	25	18	45	S. S. W. ¼ W.	N. N. W. ¼ W.
N. N. E. ½ E.	S. S. E. ½ E.	2 ½	28	7	30	S. S. W. ½ W.	N. N. W. ½ W.
N. N. E. ¾ E.	S. S. E. ¾ E.	2 ¾	30	56	15	S. S. W. ¾ W.	N. N. W. ¾ W.
N. E. *by* N.	S. E. *by* S.	3 0	33	45	0	S. W. *by* S.	N. W. *by* N.
N. E. ¾ N.	S. E. ¾ S.	3 ¼	36	33	45	S. W. ¾ S.	N. W. ¾ N.
N. E. ½ N.	S. E. ½ S.	3 ½	39	22	30	S. W. ½ S.	N. W. ½ N.
N. E. ¼ N.	S. E. ¼ S.	3 ¾	42	11	15	S. W. ¼ S.	N. W. ¼ N.
N. E.	S. E.	4 0	45	0	0	S. W.	N. W.
N. E. ¼ E.	S. E. ¼ E.	4 ¼	47	48	45	S. W. ¼ W.	N. W. ¼ W.
N. E. ½ E.	S. E. ½ E.	4 ½	50	37	30	S. W. ½ W.	N. W. ½ W.
N. E. ¾ E.	S. E. ¾ E.	4 ¾	53	26	15	S. W. ¾ W.	N. W. ¾ W.
N. E. *by* E.	S. E. *by* E.	5 0	56	15	0	S. W. *by* W.	N. W. *by* W.
N. E. *by* E. ¼ E.	S. E. *by* E. ¼ E.	5 ¼	59	3	45	S. W. *by* W. ¼ W.	N. W. *by* W. ¼ W.
N. E. *by* E. ½ E.	S. E. *by* E. ½ E.	5 ½	61	52	30	S. W. *by* W. ½ W.	N. W. *by* W. ½ W.
N. E. *by* E. ¾ E.	S. E. *by* E. ¾ E.	5 ¾	64	41	15	S. W. *by* W. ¾ W.	N. W. *by* W. ¾ W.
E. N. E.	E. S. E.	6 0	67	30	0	W. S. W.	W. N. W.
E. *by* N. ¾ N.	E. *by* S. ¾ S.	6 ¼	70	18	45	W. *by* S. ¾ S.	W. *by* N. ¾ N.
E. *by* N. ½ N.	E. *by* S. ½ S.	6 ½	73	7	30	W. *by* S. ½ S.	W. *by* N. ½ N.
E. *by* N. ¼ N.	E. *by* S. ¼ S.	6 ¾	75	56	15	W. *by* S. ¼ S.	W. *by* N. ¼ N.
E. *by* N.	E. *by* S.	7 0	78	45	0	W. *by* S.	W. *by* N.
E. ¾ N.	E. ¾ S.	7 ¼	81	33	45	W. ¾ S.	W. ¾ N.
E. ½ N.	E. ½ S.	7 ½	84	22	30	W. ½ S.	W. ½ N.
E. ¼ N.	E. ¼ S.	7 ¾	87	11	15	W. ¼ S.	W. ¼ N.
East.	East.	8 0	90	0	0	West.	West.

Plane Sailing.

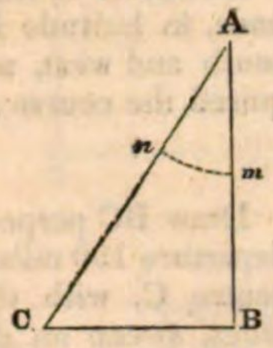
PROB. I. Given the course and distance, to find the difference of latitude and departure.

Example. A ship from St Helena, in latitude 15° 55′ S. sailed S. W. by S. 158 miles. Required the latitude come to, and departure.

By Construction.

Draw the meridian AB, and with the chord of 60° describe the arch *mn*, and make it equal to the rhumb of three points, and through *n* draw AC equal to 158 miles; from C, draw CB perpendicular to AB; then AB applied to the scale from which AC was taken will be found to measure 131·4, and BC 87·8.

Fig. 2.



By Calculation.

To find the difference of latitude.

As radius	.	10·00000
is to the cosine of the course 3 points	.	9·91985
so is the distance . 158	.	2·19866
to the difference of latitude 131·4	.	2·11851

To find the departure.

As radius	.	10·00000
is to the sine of the course 3 points	.	9·74474
so is the distance . 158	.	2·19866
to the departure . 87·8	.	1·94340

By Inspection.

In the traverse table, the difference of latitude answering to the course 3 points, and distance 158 miles, in a distance column, is 131·4, and departure 87·8.

By Gunter's Scale.

The extent from 8 points to 5 points, the complement of the course on the line of sine rhumbs (marked S. R.) will reach from the distance 158 to 131·4, the difference of latitude on the line of numbers; and the extent from 8 points to 3 points on sine rhumbs will reach from 158 to 87·8, the departure on numbers.[1]

Latitude St Helena,	15° 55′ S.
Difference of latitude, .	2 11 S.
Latitude come to, .	18 6 S.

PROB. II. Given the course and difference of latitude, to find the distance and departure.

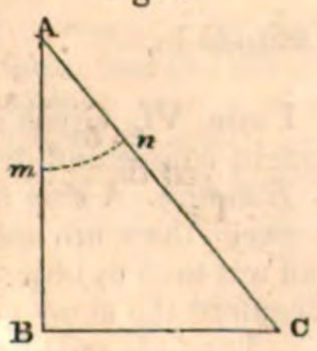
Example. A ship from St George's, in latitude 38° 45′ north, sailed S. E. ½ S.: and the latitude by observation was 35° 7′ N. Required the distance run, and departure.

Latitude St George's, .	38° 45′ N.
Latitude come to, .	35 7 N.
Difference of latitude, .	3 38 = 218 miles.

By Construction.

Draw the portion of the meridian AB equal to 218 m.: from the centre A with the chord of 60° describe the arch *mn*, which make equal to the rhumb of 3½ points: through A*n* draw the line AC, and from B draw BC perpendicular to AB, and let it be produced till it meets AC in C. Then the distance AC, being applied to the scale, will measure 282 m. and the departure BC 179 miles.

Fig. 3.



Plane Sailing.

By Calculation.

To find the distance.

As radius	.	10·00000
is to the secant of the course 3½ points	.	10·11181
so is the difference of latitude 218 m.	.	2·33846
to the distance . 282	.	2·45027

To find the departure.

As radius	.	10·00000
is to the tangent of the course 3½ points	.	9·91417
so is the difference of latitude 218	.	2·33846
to the departure . 178·9	.	2·25263

By Inspection.

Find the given difference of latitude 218 m. in a latitude column, under the course of 3½ points; opposite to which, in a distance column, is 282 miles; a departure column is 178·9 m. the distance and departure required.

By Gunter's Scale.

Extend the compass from 4½ points, the complement of the course, to 8 points on sine rhumbs; that extent will reach from the difference of latitude 218 miles to the distance 282 miles on numbers; and the extent from 4 points to the course 3½ points on the line of tangent rhumbs (marked T. R.) will reach from 218 miles to 178·9, the departure on numbers.

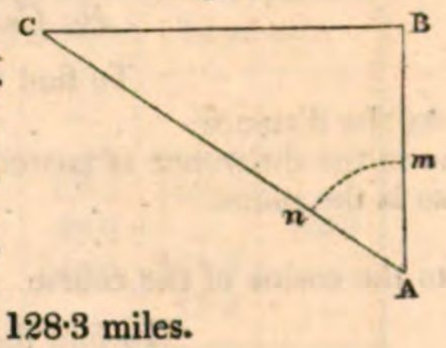
PROB. III. Given course and departure, to find the distance and difference of latitude.

Example. A ship from Palma, in latitude 28° 37′ N. sailed N. W. by W. and made 192 miles of departure. Required the distance run, and latitude come to.

By Construction.

Make the departure BC equal to 192 miles, draw BA perpendicular to BC, and from the centre C, with the chord of 60°, describe the arch *mn*, which make equal to the rhumb of 3 points, the complement of the course; draw a line through C*n*, which produce till it meet BA in A: then the distance AC being measured, will be equal to 231 m. and the difference of latitude AB will be 128·3 miles.

Fig. 4.



By Calculation.

To find the distance.

As the sine of the course 5 points	.	9·91985
is to radius .	.	10·00000
so is the departure . . 192	.	2·28330
to the distance . . 230·9	.	2·36345

To find the difference of latitude.

As the tangent of the course 5 points		10·17511
is to radius .	.	10·00000
so is the departure . . 192	.	2·28330
to the difference of latitude 128·3	.	2·10819

By Inspection.

Find the departure 192 m. in its proper column above the given course 5 points; and opposite thereto is the distance 231 miles, and difference of latitude 128·3, in their respective columns.

[1] For the method of resolving the various problems in navigation by the sliding gunter, the reader is referred to Dr Mackay's Treatise on the Description and Use of that Instrument.

Plane Sailing.

By Gunter's Scale.

The extent from 5 points to 8 points on the line of sine rhumbs, being laid from the departure 192 on numbers, will reach to the distance 231 on the same line; and the extent from 5 points to 4 points on the line of tangent rhumbs will reach from the departure 192, to the difference of latitude 128·3 on numbers.

Latitude of Palma,	28° 37′	N.
Difference of latitude,	2 8	N.
Latitude come to,	30 45	N.

Prob. IV. Given the distance and difference of latitude, to find the course and departure.

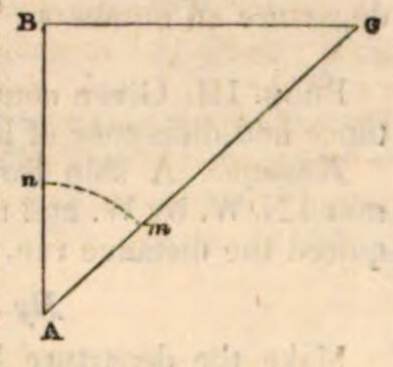
Example. A ship from a place in latitude 43° 13′ N., sails between the north and east 285 miles; and is then by observation found to be in latitude 46° 31′ N. Required the course and departure.

Latitude sailed from,	43° 13′	N.
Latitude by observation,	46 31	N.
Difference of latitude,	3 18 = 198	miles.

By Construction.

Draw the portion of the meridian AB equal to 198 miles; from B draw BC perpendicular to AB; then take the distance 285 miles from the scale, and with one foot of the compass in A describe an arch intersecting BC in C, and join AC. With the chord of 60° describe the arch *mn*, the portion of which, contained between the distance and difference of latitude, applied to the line of chords, will measure 46°, the course; and the departure BC being measured on the line of equal parts, will be found equal to 205 miles.

Fig. 5.



By Calculation.

To find the course.

As the distance	285	2·45484
is to the difference of latitude	198	2·29660
so is the radius		10·00000
to the cosine of the course	46° 0′	9·84176

To find the departure.

As radius		10·00000
is to the sine of the course	46° 0′	9·85693
so is the distance	285	2·45484
to the departure	205	2·31177

By Inspection.

Find the given distance in the table in its proper column; and if the difference of latitude answering thereto is the same as that given, namely, 198, then the departure will be found in its proper column, and the course at the top or bottom of the page, according as the difference of latitude, is found in a column marked *lat.* at top or bottom. If the difference of latitude thus found does not agree with that given, turn over till the nearest thereto is found to answer to the given distance. This is in the page marked 46 degrees at the bottom, which is the course, and the corresponding departure is 205 miles.

By Gunter's Scale.

The extent from the distance 285 to the difference of latitude 198 on numbers, will reach from 90° to 44°, the complement of the course on sines; and the extent from 90° to the course 46° on the line of sines being laid from the distance 285, will reach to the departure 205 on the line of numbers.

Plane Sailing.

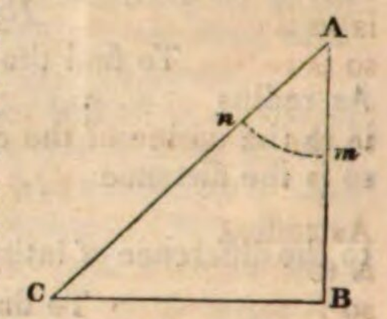
Prob. V. Given the distance and departure, to find the course and difference of latitude.

Example. A ship from Fort-Royal in the island of Grenada, in latitude 12° 9′ N., sailed 260 miles between the south and west, and made 190 miles of departure. Required the course and latitude come to.

By Construction.

Draw BC perpendicular to AB, and equal to the given departure 190 miles; then from the centre C, with the distance 260 miles, sweep an arch intersecting AB in A, and join AC. Now describe an arch from the centre A with the chord of 60°, and the portion *mn* of this arch, contained between the distance and difference of latitude, measured on the line of chords, will be 47°, the course; and the difference of latitude AB, applied to the scale of equal parts, measures 177½ miles.

Fig. 6.



By Calculation.

To find the course.

As the distance	260	2·41497
is to the departure	190	2·27875
so is radius		10·00000
to the sine of the course	46° 57′	9·86378

To find the difference of latitude.

As radius		10·00000
is to the cosine of the course	46° 57′	9·83419
so is the distance	260	2·41497
to the difference of latitude	177·5	2·24916

By Inspection.

Seek in the traverse table until the nearest to the given departure is found in the same line with the given distance 260. This is found to be in the page marked 47° at the bottom, which is the course; and the corresponding difference of latitude is 177·3.

By Gunter's Scale.

The extent of the compass, from the distance 260 to the departure 190 on the line of numbers, will reach from 90° to 47°, the course on the line of sines: and the extent from 90° to 43°, the complement of the course on sines, will reach from the distance 260 to the difference of latitude 177½ on the line of numbers.

Latitude Fort-Royal,	12° 9′	N.
Difference of latitude,	177 = 2 57	S.
Latitude in,	9 12	N.

Prob. VI. Given difference of latitude and departure, sought course and distance.

Example. A ship from a port in latitude 7° 56′ S. sailed between the south and east till her departure was 132 miles, and was then by observation found to be in latitude 12° 3′ S. Required the course and distance.

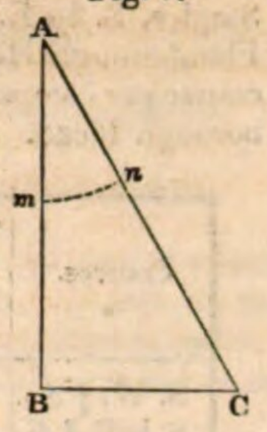
Latitude sailed from,	7° 56′	S.
Latitude in by observation,	12 3	S.
Difference of latitude,	4 7 = 247.	

Traverse Sailing.

By Construction.

Draw the portion of the meridian AB equal to the difference of latitude 247 miles; from B draw BC perpendicular to AB, and equal to the given departure 132 miles, and join AC: then with the chord of 60° describe an arch from the centre A; and the portion *mn* of this arch, being applied to the line of chords, will measure about 28°; and the distance AC, measured on the line of equal parts, will be 280 miles.

Fig. 7.



By Calculation.

To find the course.

As the difference of latitude .	247	2·39270
is to the departure . . .	132	2·12057
so is radius		10·00000
to the tangent of the course .	28° 7′	9·72787

To find the distance.

As radius		10·00000
is to the secant of the course	28° 7′ .	10·05454
so is the difference of latitude	247 . .	2·39270
to the distance	280 . .	2·44724

By Inspection.

Seek in the table till the given difference of latitude and departure, or the nearest thereto, are found together in their respective columns, which will be under 28°, the required course; and the distance answering thereto is 280 miles.

By Gunter's Scale.

The extent from the given difference of latitude 247 to the departure 132 on the line of numbers, will reach from 45° to 28°, the course on the line of tangents; and the extent from 62°, the complement of the course, to 90° on sines, will reach from the difference of latitude 247 to the distance 280 on numbers.

CHAP. III.—OF TRAVERSE SAILING.

If a ship sail upon two or more courses in a given time, the irregular tract she describes is called a *traverse;* and to resolve a traverse, is the method of reducing these several courses, and the distances run, into a single course and distance. The method chiefly used for this purpose at sea is by inspection, which shall therefore be principally adhered to, and is as follows.

Make a table of a breadth and depth sufficient to contain the several courses, &c. This table is to be divided into six columns; the courses are to be put in the first, and the corresponding distances in the second column; the third and fourth columns are to contain the differences of latitude, and the two last the departures.

Now, the several courses and their corresponding distances being properly arranged in the table, find the difference of latitude and departure answering to each in the traverse table; remembering that the difference of latitude is to be put in a north or south column, according as the course is in the northern or southern hemisphere; and that the departure is to be put in an east column if the course is easterly, but in a west column if the course is westerly; observing also, that the departure is less than the difference of latitude when the course is less than four points, or 45°; otherwise greater.

Add up the columns of northing, southing, easting, and westing, and set down the sum of each at its bottom; then the difference between the sums of the north and south columns will be the difference of latitude made good, of the same name with the greater; and the difference between the sums of the east and west columns is the departure made good, of the same name with the greater sum.

Traverse Sailing.

Now, seek in the traverse table till a difference of latitude and departure are found to agree as nearly as possible with those above; then the distance will be found on the same line, and the course at the top or bottom of the page, according as the difference of latitude is greater or less than the departure.

In order to resolve a traverse by construction, describe a circle with the chord of 60°, in which draw two diameters at right angles to each other, at whose extremities are to be marked the initials of the cardinal points, north being uppermost.

Lay off each course on the circumference, reckoned from its proper meridian; and from the centre to each point draw lines, which are to be marked with the proper number of the course.

On the first radius lay off the first distance from the centre, and through its extremity, and parallel to the second radius, draw the second distance, of its proper length; through the extremity of the second distance, and parallel to the third radius, draw the third distance, of its proper length; and thus proceed until all the distances are drawn.

A line drawn from the extremity of the last distance to the centre of the circle will represent the distance made good; and a line drawn from the same point perpendicular to the meridian, produced if necessary, will represent the departure; and the portion of the meridian intercepted between the centre and departure will be the difference of latitude made good.

Ex. 1. A ship from Fyal, in lat. 38° 32′ N., sailed as follows: E. S. E. 163 miles, S. W. ½ W. 110 miles, S. E. ¾ S. 180 miles, and N. by E. 68 miles. Required the latitude come to, the course, and distance made good.

By Inspection.

Course.	Dist.	Diff. of Latitude. N.	Diff. of Latitude. S.	Departure. E.	Departure. W.
E. S. E.....	163	...	62·4	150·6	...
S. W. ½ W.	110	...	69 8	...	85·0
S. E. ¾ S...	180	...	144·5	107·2	...
N. *by* E....	68	66·7	...	13·3	...
		66·7	276·7	271·1	85·0
			66·7	85·0	
S. 41 ½ E..	281		210·0	186·1	

Latitude left.....38° 32′ N.
Difference of latitude..... 3 21 S.

Latitude come to.....35 11 N.

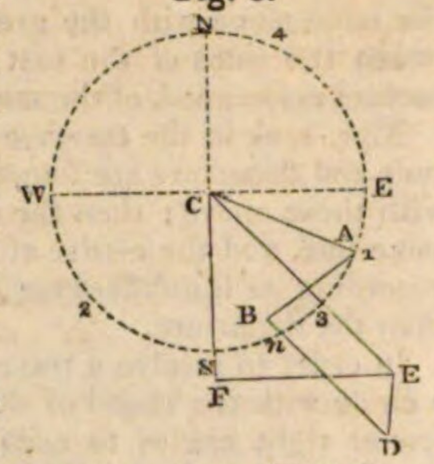
By Construction.

With the chord of 60° describe the circle NE, SW (fig. 8), the centre of which represents the place the ship sailed from; draw two diameters NS, EW at right angles to each other, the one representing the meridian, and the other the parallel of latitude of the place sailed from. Take each course from the line of rhumbs, lay it off on the circumference from its proper meridian, and number it in order 1, 2, 3, 4. Upon the first rhumb C1, lay off the first distance 163 miles from C to A; through it draw the second distance AB parallel to C2, and equal to 110 miles;

Traverse Sailing.

through B draw BD equal to 180 miles, and parallel to C3; and draw DE parallel to C4, and equal to 68 miles. Now CE being joined, will represent the distance made good; which, applied to the scale, will measure 281 miles. The arch S*n*, which represents the course, being measured on the line of chords, will be found equal to 41½°. From E draw EF perpendicular to CS produced; then CF will be the difference of latitude, and FE the departure made good; which, applied to the scale, will be found to measure 210 and 186 miles respectively.

Fig. 8.



As the method by construction is scarcely ever practised at sea, it seems therefore unnecessary to apply it to the solution of the following examples.

Ex. 2. A ship from latitude 1° 38′ S. sailed as under. Required her present latitude, course, and distance made good.

Course.	Dist.	Diff. of Latitude.		Departure.	
		N.	S.	E.	W.
N. W. *by* N...	43	35·8	...	...	23·9
W. N. W.....	78	29·9	...	...	72·1
S. E. *by* E...	56	...	31·1	46·6	...
W. S. W. ½ W.	62	...	18·0	...	59·3
N. ¾ E.....	85	84·1	...	12·5	...
		149·8	49·1	59·1	155·3
		49·1			59·1
N. 44° W.....	139	100·7 = 1° 41′			96·2
Latitude left.....		1 38 S.			
Latitude come to.....		0 3 N.			

Ex. 3. Yesterday at noon we were in latitude 13° 12′ N., and since then have run as follows: S. S. E. 36 miles, S. 12 miles, N. W. ½ W. 28 miles, W. 30 miles, S. W. 42 miles, W. *by* N. 39 miles, and N. 20 miles. Required our present latitude, departure, and direct course and distance.

Course.	Dist.	Diff. of Latitude.		Departure.	
		N.	S.	E.	W.
S. S. E.....	36	...	33·3	13·8	...
S.....	12	...	12·0	...	...
N. W. ½ W.	28	17·8	...	...	21·6
W.....	30	...	...	...	30·0
S. W.....	42	...	29·7	...	29·7
W. *by* N...	39	7·6	...	...	38·2
N.....	20	20·0	...	...	...
		45·4	75·0	13·8	119·5
			45·4		13·8
S 74° W...	110		29·6 = 0° 30′		105·7
Yesterday's latitude.....			13 12 N.		
Present latitude.....			12 42 N.		

Parallel Sailing.

Ex. 4. The course per compass from Greigsness[1] to the May is S. W. ¼ S., distance 58 miles; from the May to the Staples, S. *by* E. ¾ E., 44 miles; and from the Staples to Flamborough Head, S. *by* E., 110 miles. Required the course per compass, and distance from Greigsness to Flamborough Head.

Courses.	Dist.	Diff. of Latitude.		Departure.	
		N.	S.	E.	W.
S. W. ¼ S...	58	...	43·0	...	38·9
S. *by* E. ¾ E.	44	...	41·4	14·8	...
S. *by* E.....	11	...	107·9	21·5	...
			192·3	36·3	38·9
					36·3
					2·6

Hence the course per compass is nearly S. 1° W., and distance 192⅓ miles.

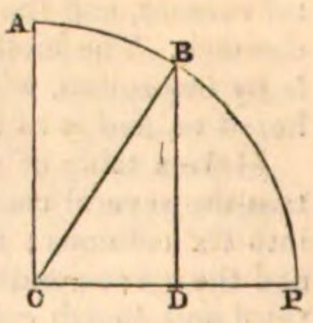
CHAP. IV.—OF PARALLEL SAILING

The figure of the earth is spherical, and the meridians gradually approach each other, and meet at the poles. The difference of longitude between any two places is the angle at the pole contained between the meridians of those places, or it is the arch of the equator intercepted between the meridians of the given places; and the meridian distance between two places in the same parallel is the arch thereof contained between their meridians. It hence follows, that the meridian distance, answering to the same difference of longitude, will vary with the latitude of the parallel upon which it is reckoned; and the same difference of longitude will not answer to a given meridian distance when reckoned upon different parallels.

Parallel sailing is, therefore, the method of finding the distance between two places lying in the same parallel whose longitudes are known; or, to find the difference of longitude answering to a given distance run in an east or west direction. This sailing is particularly useful in making low or small islands.

In order to illustrate the principles of parallel sailing, let CABP (fig. 9) represent a section of one fourth part of the earth, the arch ABP being part of a meridian; CA the equatorial, and CP the polar semi-axis. Also let B be the situation of any given place on the earth; and join BC, which will be equal to CA or CP.[2] The arch AB, or angle ACB, is the measure of the latitude of the place B; and the arch BP, or angle BCP, is that of its complement. If BD be drawn from B perpendicular to CP, it will represent the cosine of latitude to the radius BC or CA.

Fig. 9.



Now since circles and similar portions of circles are in the direct ratio of their radii; therefore,

As radius
Is to the cosine of latitude,
So is any given portion of the equator
To a similar portion of the given parallel.

But the difference of longitude is an arch of the equa-

[1] Greigsness is about 2½ miles distant from Aberdeen, in nearly a S. E. *by* E. ½ E. direction.

[2] This is not strictly true, as the figure of the earth is that of an oblate spheroid; and therefore the radius of curvature varies with the latitude. The difference between CA and CP, according to Sir Issac Newton's hypothesis, is about 17 miles.

Parallel Sailing.

tor, and the distance between any two places under the same parallel is a similar portion of that parallel.

Hence R : cosine latitude : : diff. longitude : distance.

And, by inversion,

cosine latitude : R : : distance : diff. of longitude.

Also,

diff. of longitude : distance : : R : cos. latitude.

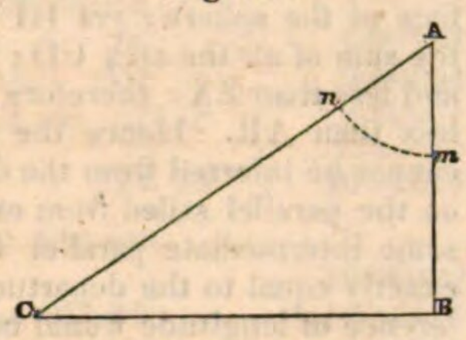
PROB. I. Given the latitude of a parallel, and the number of miles contained in a portion of the equator, to find the miles contained in a similar portion of that parallel.

Ex. 1. Required the number of miles contained in a degree of longitude in latitude 55° 58′.

By Construction.

Draw the indefinite right line AB (fig. 10); make the angle BAC equal to the given latitude 55° 58′, and AC equal to the number of miles contained in a degree of longitude at the equator, namely, 60: from C draw CB perpendicular to AB; and AB, being measured on the line of equal parts, will be found equal to 33·5, the miles required.

Fig. 10.



By Calculation.

As radius . . .		10·00000
is to the cosine of latitude .	55° 58′	9·74794
so is miles in a degree of long. at eq.	60	1·77815
to the miles in a deg. in the given par.	33·58	1·52609

By Inspection.

To 56°, the nearest degree to the given latitude, and distance 60 miles, the corresponding difference of latitude is 33·6, which is the miles required.

By Gunter's Scale.

The extent from 90° to 34°, the complement of the given latitude on the line of sines, will reach from 60 to 33·6 on the line of numbers.

There are two lines on the other side of the scale, with respect to Gunter's line, adapted to this particular purpose; one of which is entitled *chords*, and contains the several degrees of latitude. The other, marked M. L. signifying *miles of longitude*, is the *line of longitudes*, and shows the number of miles in a degree of longitude in each parallel. The use of these lines is therefore obvious.

Ex. 2. Required the distance between Treguier in France, in longitude 3° 14′ W., and Gaspey Bay, in longitude 64° 27′ W., the common latitude being 48° 47′ N.

Longitude Treguier, . .	3° 14′ W.	
Longitude Gaspey Bay, . .	64 27 W.	
Difference of longitude . .	61 13=3673′	
As radius		10·00000
is to the cosine of latitude .	48° 47′	9·81882
so is the difference of longitude	3673	3·56502
to the distance . .	2420	3·38384

PROB. II. Given the number of miles contained in a portion of a known parallel, to find the number of miles in a similar portion of the equator.

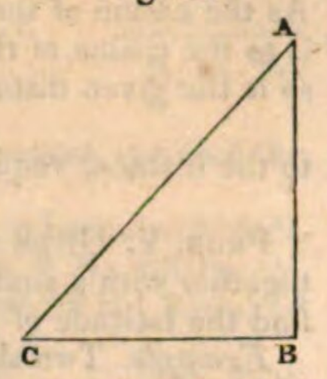
Example. A ship from Cape Finisterre, in latitude 42° 52′ N., and longitude 9° 17′ W., sailed due west 342 miles. Required the longitude come to.

By Construction.

Parallel Sailing.

Draw the straight line AB (fig. 11) equal to the given distance 342 miles, and make the angle BAC equal to 42° 52′, the given latitude: from B draw BC perpendicular to AB, meeting AC in C; then AC applied to the scale will measure 466½, the difference of longitude required.

Fig 11.



By Calculation.

As radius		10·00000
is to the secant of latitude .	42° 52′	10·13493
so is the distance . . .	342	2·53403
to the difference of longitude .	466·6	2·66896
Longitude Cape Finisterre, . .		9° 17′ W.
Difference of longitude, . .		7 47 W.
Longitude come to, . . .		17 4 W.

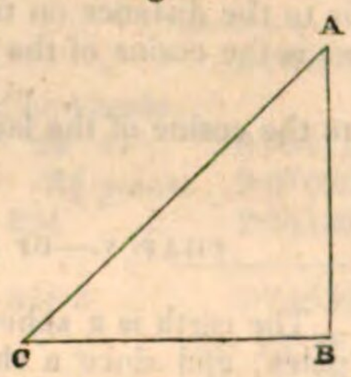
PROB. III. Given the number of miles contained in any portion of the equator, and the miles in a similar portion of a parallel; to find the latitude of that parallel.

Example. A ship sailed due east 358 miles, and was found by observation to have differed her longitude 8° 42′. Required the latitude of the parallel.

By Construction.

Make the line AB (fig. 12) equal to the given distance; to which let BC be drawn perpendicular, with an extent equal to 522′, the difference of longitude; describe an arch from the centre A, cutting BC in C; then the angle BAC, being measured by means of the line of chords, will be found equal to 46⅔°, the required latitude.

Fig. 12.



By Calculation.

As the distance . . .	358	2·55388
is to the difference of longitude . .	522	2·71767
so is radius		10·00000
to the secant of the latitude .	46° 42′	10·16379

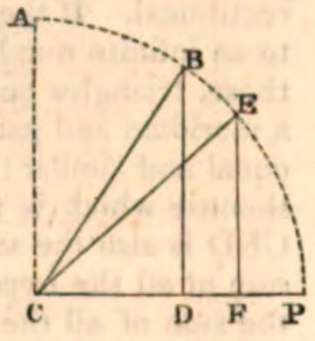
PROB. IV. Given the number of miles contained in the portion of a known parallel, to find the length of a similar portion of another known parallel.

Example. From two ports in latitude 33° 58′ N., distance 348 miles, two ships sail directly north till they are in latitude 48° 23′ N. Required their distance.

By Construction.

Draw the line CB, CE (fig. 13), making angles with CP equal to the complements of the given latitudes, namely, 56° 2′ and 41° 37′ respectively; make BD equal to the given distance 348 miles, and perpendicular to CP; now from the centre C, with the radius CB, describe an arch intersecting CE in E; then EF drawn from the point E, perpendicular to CP, will represent the distance required; which being applied to the scale, will measure 278½ miles.

Fig. 13.



Middle Latitude Sailing.

By Calculation.

As the cosine of the latitude left	33° 58′	9·91874
is to the cosine of the lat. come to	48 23	9·82226
so is the given distance	348	2·54158
to the distance required	278·6	2·44510

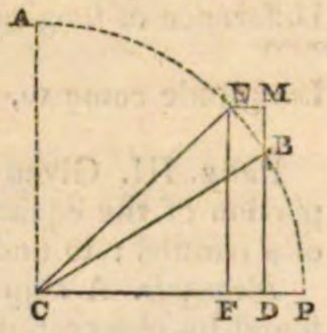
Prob. V. Given a certain portion of a known parallel, together with a similar portion of an unknown parallel; to find the latitude of that parallel.

Example. Two ships, in latitude 56° 0′ N., distant 180 miles, sail due south; and having come to the same parallel, are now 232 miles distant. The latitude of that parallel is required.

By Construction.

Make DB (fig. 14) equal to the first distance 180 miles, DM equal to the second 232, and the angle DBC equal to the given latitude 56°; from the centre C, with the radius CB, describe the arch BE; and through M draw ME parallel to CD, intersecting the arch BE in E; join EC and draw EF perpendicular to CD: then the angle FEC will be the latitude required; which being measured, will be found equal to 43° 53′.

Fig. 14.



By Calculation.

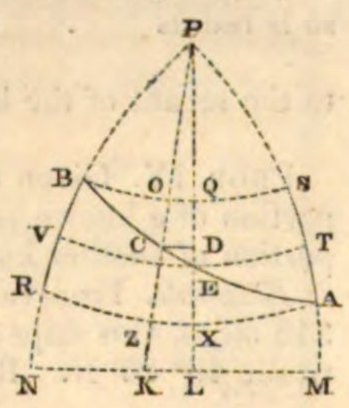
As the distance on the known parallel	180	2·25527
is to the distance on that required	232	2·36549
so is the cosine of the latitude left	56° 0′	9·74756
to the cosine of the latitude come to	43 53	9·85778

CHAP. V.—OF MIDDLE LATITUDE SAILING.

The earth is a sphere, and the meridians meet at the poles: and since a rhumb-line makes equal angles with every meridian, the line a ship describes is, therefore, that kind of a curve called a *spiral*.

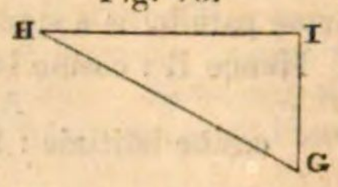
Let AB (fig. 15) be any given distance sailed upon an oblique rhumb, PBN, PAM the extreme meridians, MN a portion of the equator, and PCK, PEL two meridians intersecting the distance AB in the points CE infinitely near each other. If the arches BS, CD, and AR, be described parallel to the equator, it is hence evident that AS is the difference of latitude, and the arch MN of the equator the difference of longitude, answering to the given distance AB and course PAB.

Fig. 15.



Now, since CE represents a very small portion of the distance AB, DE will be the correspondent portion of a meridian; hence the triangle EDC may be considered as rectilineal. If the distance be supposed to be divided into an infinite number of parts, each equal to CE, and upon these, triangles be constructed whose sides are portions of a meridian and parallel, it is evident these triangles will be equal and similar; for, besides the right angle, and hypothenuse which is the same in each, the course or angle CED is also the same. Hence, by the 12th of V. Euc. the sum of all the hypothenuses CE, or the distance AB, is to the sum of all the sides DE, or the difference of latitude AS, as one of the hypothenuses CE is to the corresponding side DE. Now, let the triangle GIH (fig. 16) be constructed similar to the triangle CDE, having the angle G equal to the course: then, as GH : GI :: CE : DC :: AB : AS.

Fig. 16.



Middle Latitude Sailing.

Hence, if GH be made equal to the given distance AB, then GI will be the corresponding difference of latitude.

In like manner, the sum of all the hypothenuses CE, or the distance AB, is to the sum of all the sides CD, as CE is to CD, or as GH to HI, because of the similar triangles.

The several parts of the same rectilineal triangle will, therefore, represent the course, distance, difference of latitude, and departure.

Although the parts HG, GI, and angle G of the rectilineal triangle GIH, are equal to the corresponding parts AB, AS, and angle A, of the triangle ASB upon the surface of the sphere; yet HI is not equal to BS, for HI is the sum of all the arcs CD; but CD is greater than OQ, and less than ZX: therefore HI is greater than BS, and less than AR. Hence the difference of longitude MN cannot be inferred from the departure reckoned either upon the parallel sailed from or upon that come to, but on some intermediate parallel TV, such that the arch TV is exactly equal to the departure; and, in this case, the difference of longitude would be easily obtained. For TV is to MN as the sine PT to the sine PM; that is, as the cosine of latitude is to the radius.

The latitude of the parallel TV is not, however, easily determined with accuracy: various methods have, therefore, been taken in order to obtain it nearly, with as little trouble as possible; first, by taking the arithmetical mean of the two latitudes for that of the mean parallel; secondly, by using the arithmetical mean of the cosines of the latitudes; thirdly, by using the geometrical mean of the cosines of the latitudes; and, lastly, by employing the parallel deduced from the mean of the meridional parts of the two latitudes. The first of these methods is that which is generally used.

In order to illustrate the computations in middle latitude sailing, let the triangle ABC (fig. 17) represent a figure in plane sailing, wherein AB is the difference of latitude, AC the distance, BC the departure, and the angle BAC the course. Also, let the triangle DBC be a figure in parallel sailing, in which DC is the difference of longitude, BC the meridian distance, and the angle DCB the middle latitude. In these triangles there is, therefore, one side BC common to both; and that triangle is to be first resolved in which two parts are given, and then the unknown parts of the other triangle will be easily obtained.

Fig. 17.

Prob. I. Given the latitudes and longitudes of two places, to find the course and distance between them.

Example. Required the course and distance from the Island of May, in latitude 56° 12′ N. and longitude 2° 37′ W., to the Naze of Norway, in latitude 57° 50′ N. and longitude 7° 27′ E.

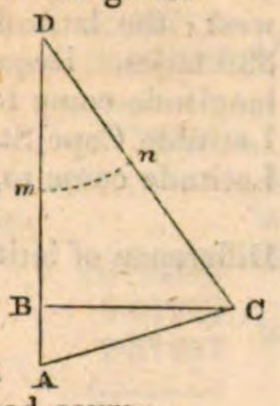
Latitude Isle of May,	56° 12′ N.	56° 12′
Latitude Naze of Norway,	57 50 N.	57 50
Difference of latitude,	1 38 = 98′	114 2
Middle latitude,		57 1
Longitude Isle of May,	2 37 W.	
Longitude Naze of Norway,	7 27 E.	
Difference of longitude,	10 4 = 604′	

Middle Latitude Sailing.

By Construction.

Draw the right line AD (fig. 18) to represent the meridian of the May; with the chord of 60° describe the arch *mn*, upon which lay off the chord of 32° 59′, the complement of the middle latitude from *m* to *n*: from D through *n* draw the line DC equal to 604′ the difference of longitude, and from C draw CB perpendicular to AD: make BA equal to 98′ the difference of latitude, and join AC; which applied to the scale will measure 343 miles, the distance sought: and the angle A being measured by means of the line of chords, will be found equal to 73° 24′, the required course.

Fig. 18.



By Calculation.

To find the course.[1]

As the difference of latitude	98′	.	1·99123
is to the difference of longitude	604	.	2·78104
so is the cosine of middle latitude	57° 1′		9·73591
to the tangent of the cosine	73 24	.	10·52572

To find the distance.

As radius		.	10·00000
is to the secant of the course	73° 24′	.	10·54411
so is the difference of latitude	98′	.	1·99123
to the distance	343	.	2·53534

The true course, therefore, from the Island of May to the Naze of Norway is N. 73° 24′ E., E. N. E. $\frac{3}{4}$ E. nearly; but as the variation at the May is $2\frac{1}{2}$ points west, therefore the course per compass from the May is E. *by* S.

Prob. II. Given one latitude, course, and distance sailed, to find the other latitude and difference of longitude.

Example. A ship from Brest, in latitude 48° 23′ N. and longitude 4° 30′ W., sailed S. W. $\frac{3}{4}$ W. 238 miles. Required the latitude and longitude come to.

By Construction.

With the course and distance construct the triangle ABC (fig. 17), and the difference of latitude AB, being measured, will be found equal to 142 miles: hence the latitude come to is 46° 1′ N., and the middle latitude 47° 12′. Now make the angle DCB equal to 47° 12′; and DC, being measured, will be 281, the difference of longitude: hence the longitude come to is 9° 11′ W.

By Calculation.

To find the difference of latitude.

As radius		.	10·00000
is to the cosine of the course	$4\frac{3}{4}$	.	9·77503
so is the distance	238	.	2·37658
to the difference of latitude	141·8	.	2·15161

Latitude of Brest,	48° 23′ N.	.	48° 23′ N.
Difference of lat.	2 22 S.	.	half 1 11 S.
Lat. come to,	46 1 N.	Mid. lat.	47 12 N.

To find the difference of longitude.[2]

As the cosine of mid. lat.	47° 12′		9·83215
is to the sine of the course	$4\frac{3}{4}$ points		9·90483
so is the distance	238	.	2·37658
to the difference of longitude	281·3	.	2·44926

Longitude of Brest,		.	4° 30′ W.
Difference of longitude,		.	4 41 W.
Longitude come to,		.	9 11 W.

Middle Latitude Sailing.

Prob. III. Given both latitudes and course, required the distance and difference of longitude.

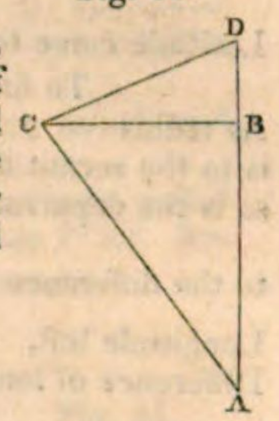
Example. A ship from St Antonio, in latitude 17° 0′ N. and longitude 24° 25′ W., sailed N. W. $\frac{3}{4}$ N., till by observation her latitude was found to be 28° 34′ N. Required the distance sailed, and longitude come to.

Latitude St Antonio,	17° 0′ N.	.	17° 0′ N.
Latitude by observation,	28 34 N.	.	28 34 N.
Difference of lat.	11 34 = 694′		45 34
		Middle lat.	22 47

By Construction.

Fig. 19.

Construct the triangle ABC (fig. 19), with the given course and difference of latitude, and make the angle BCD equal to the middle latitude. Now the distance AC and difference of longitude DC being measured, will be found equal to 864 and 558 respectively.



By Calculation.

To find the distance.

As radius		.	10·00000
is to the secant of the course	$3\frac{1}{4}$ points		10·09517
so is the difference of lat.	694	.	2·84136
to the distance	864	.	2·93653

To find the difference of longitude.

As the cosine of middle latitude	22° 47′		9·96472
is to the tangent of the course	$3\frac{3}{4}$ points		9·87020
so is the difference of latitude	694	.	2·84136
to the difference of longitude	558·3	.	2·74684

Longitude of St Antonio,		.	24° 25′ W.
Difference of longitude,		.	9 18 W.
Longitude come to,		.	33 43 W.

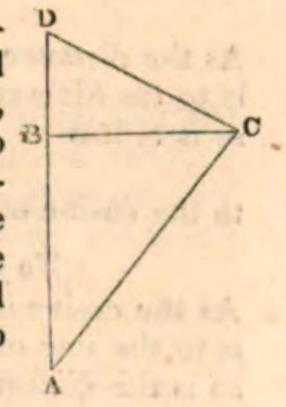
Prob. IV. Given one latitude, course, and departure, to find the other latitude, distance, and difference of longitude.

Example. A ship from latitude 26° 30′ N., and longitude 45° 30′ W., sailed N. E. $\frac{1}{2}$ N. till her departure is 216 miles. Required the distance run, and latitude and longitude come to.

By Construction.

Fig. 20.

With the course and departure construct the triangle ABC (fig. 20), and the distance and difference of latitude, being measured, will be found equal to 340 and 263 respectively. Hence the latitude come to is 30° 53′, and middle latitude 28° 42′. Now make the angle BCD equal to the middle latitude, and the difference of longitude DC applied to the scale will measure 246′.



[1] For R : cosine mid. lat. :: diff. of long. : departure,
And diff. of lat. : dep. :: R : tangent course;
Hence diff. of lat. : cosine mid. lat. :: diff. of long. : tang. course,
Or diff. of lat. : diff. of long. :: cosine mid. lat. : tang. course.

[2] This proportion is obvious, by considering the whole figure as an oblique angled plane triangle.

Middle Latitude Sailing.

By Calculation.

To find the distance.

As the sine of the course	3½ points	9·80236
is to radius . . .		10·00000
so is the departure .	216 . .	2·33445
to the distance . .	340·5 . .	2·53209

To find the difference of latitude.

As the tangent of the course	3½ points	9·91417
is to radius . . .		10·00000
so is the departure .	216 . .	2·33445
to the difference of lat.	263·2 .	2·42028

Latitude sailed from,	26° 30′ N.		26° 30′ N.
Difference of latitude,	4 23 N.	half	2 12 N.
Latitude come to,	30 53 N.	Mid. lat.	28 42 N.

To find the difference of longitude.

As radius		10·00000
is to the secant of the mid. lat.	28° 42′	10·05693
so is the departure .	216	2·33445
to the difference of longitude	246·2	2·39138

Longitude left, . . .	45° 30′ W.
Difference of longitude, . .	4 6 E.
Longitude come to, . . .	41 24 W.

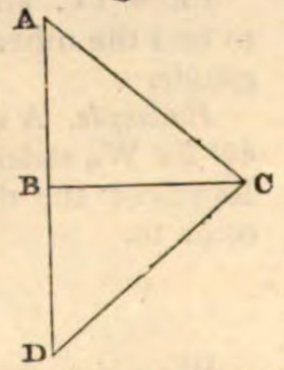
PROB. V. Given both latitudes and distance to find the course and difference of longitude.

Example. From Cape Sable, in latitude 43° 24′ N. and longitude 65° 39′ W., a ship sailed 246 miles on a direct course between the south and east, and was then by observation in latitude 40° 48′ N. Required the course and longitude in.

Latitude Cape Sable,	43° 24′ N.	43° 24′ N.
Latitude by observation,	40 48 N.	40 48 N.
Difference of latitude,	2 36 = 156′,	sum 84 12
	Middle latitude,	42 6

By Construction.

Fig. 21.



Make AB (fig. 21) equal to 156 miles; draw BC perpendicular to AB, and make AC equal to 246 miles. Draw CD, making with CB an angle of 42° 6′ the middle latitude. Now DC will be found to measure 256, and the course or angle A will measure 50° 39′.

By Calculation.

To find the course.

As the distance . .	246 .	2·39093
is to the difference of latitude	156 . .	2·19312
so is radius		10·00000
to the cosine of the course	50° 39′	9·80219

To find the difference of longitude.

As the cosine of middle latitude	42° 6′	9·87039
is to the sine of the course .	50 39	9·88834
so is the distance .	246	2·39093
to the difference of longitude .	256·4	2·40888
Longitude Cape Sable, . . .		65° 39′ W.
Difference of longitude, . .		4 16 E.
Longitude come to, . . .		61 23′ W.

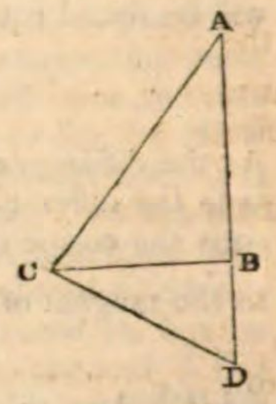
PROB. VI. Given both latitudes and departure; sought the course, distance, and difference of longitude.

Example. A ship from Cape St Vincent, in latitude 37° 2′ N., longitude 9° 2′ W., sails between the south and west; the latitude come to is 18° 16′ N., and departure 838 miles. Required the course and distance run, and longitude come to.

Latitude Cape St Vincent,	37° 2′ N.		37° 2′
Latitude come to, .	18 16 N.		18 16
Difference of latitude,	18 46 = 2126,	sum	55 18
	Middle latitude,		27 39

By Construction.

Fig. 22.



Make AB (fig. 22) equal to the difference of latitude 1126 miles, and BC equal to the departure 838, and join AC; draw CD so as to make an angle with CB equal to the middle latitude 27° 39′. Then the course being measured on chords is about 36⅔°, and the distance and difference of longitude, measured on the line of equal parts, will be found to be 1403 and 946 respectively.

By Calculation.

To find the course.

As the difference of latitude	1126	3·05154
is to the departure .	838	2·92324
so is radius		10·00000
to the tangent of the course	36° 39′	9·87170

To find the distance.

As radius		10·00000
is to the secant of the course	36° 39′	10·09566
so is the difference of latitude	1126	3·05154
to the distance	1403	3·14720

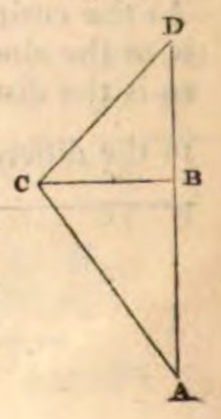
To find the difference of longitude.

As radius		10·00000
is to the secant of mid. lat. .	27° 39′	10·05266
so is the departure . .	838 .	2·92324
to the difference of longitude .	946 .	2·97590
Longitude Cape St Vincent, . . .		9° 2′ W.
Difference of longitude, . . .		15 46 W.
Longitude come to, . . .		24 48 W.

PROB. VII. Given one latitude, distance, and departure; to find the other latitude, course, and difference of longitude.

Example. A ship from Bordeaux, in latitude 44° 50′ N., and longitude 0° 35′ W., sailed between the north and west 374 miles, and made 210 miles of westing. Required the course, and the latitude and longitude come to.

Fig. 23.



By Construction.

With the given distance and departure make the triangle ABC (fig. 23). Now the course being measured on the line of chords is about 34⅙°, and the difference of latitude on the line of numbers is 309 miles: hence the latitude come to is 49° 59′ N., and middle 47° 25′. Then make the angle BCD equal to 47° 25′, and DC being measured will be 310 miles, the difference of longitude.

Middle Latitude Sailing.

By Calculation.

To find the course.

As the distance	374 .	2·57287
is to the departure	210 .	2·32222
so is radius		10·00000
to the sine of the course .	34° 10′ .	9·74935

To find the difference of latitude.

As radius		10·00000
is to the cosine of the course .	34° 10′ .	9·91772
so is the distance . . .	374 .	2·57287
to the difference of latitude .	309·4	2·49059

Latitude of Bordeaux, .	44° 50′ N.	.	44° 50′
Difference of latitude, . .	5 9 N.	half	2 35
Latitude come to, . .	49 59 N.	mid. lat.	47 25

To find the difference of longitude.

As radius		10·00000
is to the secant of mid. lat. . .	47° 25′	10·16963
so is the departure . . .	210	2·32222
to the difference of longitude .	310·3	2·49185

Longitude of Bordeaux, ...	0° 35′ W.
Difference of longitude, ...	5 10 W.
Longitude in, ...	5 45 W.

PROB. VIII. Given one latitude, departure, and difference of longitude; to find the other latitude, course, and distance.

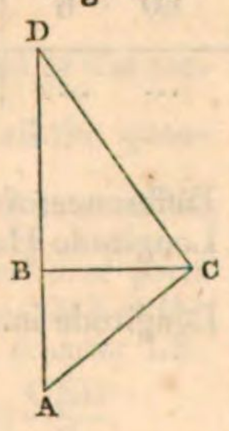
Example. A ship from latitude 54° 56′ N., longitude 1° 10′ W., sailed between the north and east till by observation she was found to be in longitude 5° 26′ E., and has made 220 miles of easting. Required the latitude come to, course, and distance run.

Longitude left, ...	1° 10′ W.
Longitude come to, ...	5 26 E.
Difference of longitude, . . .	6 36=396

By Construction.

Make BC (fig. 24) equal to the departure 220, and CD equal to the difference of longitude 396: then the middle latitude BCD being measured, will be found equal to 56° 15′: hence the latitude come to is 57° 34′, and difference of latitude 158′. Now make AB equal to 158, and join AC, which, applied to the scale, will measure 271 miles. Also the course BAC, being measured on chords, will be found equal to $54\frac{1}{3}$°.

Fig. 24.



By Calculation.

To find the middle latitude.

As the departure . . .	220	2·34242
is to the difference of longitude .	396	2·59769
so is radius		10·00000
to the secant of middle latitude .	56° 15′	10·25527
Double middle latitude, . .	112° 30′	
Latitude left, ...	54 56	
Latitude come to, . . .	57 34	
Difference of latitude, . .	2 38=158 miles.	

Middle Latitude Sailing.

To find the course.

As the difference of latitude . .	158	2·19866
is to the departure . . .	220	2·34242
so is radius		10·00000
to the tangent of the course .	54° 19′	10·14376

To find the distance.

As radius		10·00000
is to the secant of the course . .	54° 19′	10·23410
so is the difference of latitude .	158	2·19866
to the distance . . .	270·9	2·43276

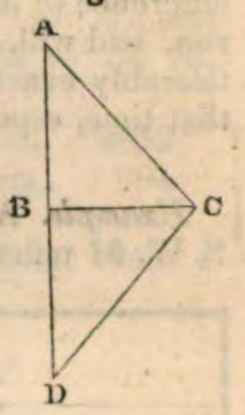
PROB. IX. Given the course and distance sailed, and difference of longitude; to find both latitudes.

Example. A ship from a port in north latitude, sailed S. E. $\frac{1}{4}$ S. 438 miles, and differed her longitude 7° 28′. Required the latitude sailed from, and that come to.

By Construction.

With the course and distance construct the triangle ABC (fig. 25), and make DC equal to 448 the given difference of longitude. Now the middle latitude BCD will measure 48° 58′, and the difference of latitude AB 324 miles; hence the latitude left is 51° 40′, and that come to 46° 16′.

Fig. 25.



By Calculation.

To find the difference of latitude.

As radius		10·00000
is to the cosine of the course .	$3\frac{3}{4}$ points	9·86979
so is the distance . . .	438	2·64147
to the difference of latitude . .	324·5	2·51126

To find the middle latitude.

As the difference of longitude . .	448	2·65128
is to the distance . . .	438	2·64147
so is the sine of the course . .	$3\frac{3}{4}$ points	9·82708
to the cosine of mid. latitude .	48° 58′	9·81727
Half difference of latitude, . .	2 42	
Latitude sailed from, . .	51 40	
Latitude come to, . .	46 16	

PROB. X. To determine the difference of longitude made good upon compound courses, by middle latitude sailing.

RULE I. With the several courses and distances find the difference of latitude and departure made good, and the ship's present latitude, as in traverse sailing.

Now enter the traverse table with the given middle latitude, and the departure in a latitude column, the corresponding distance will be the difference of longitude, of the same name with the departure.

Example. A ship from Cape Clear, in latitude 51° 18′ N., longitude 9° 46′ W. sailed as follows:—S. W. *by* S. 54 miles, W. *by* N. 63 miles, N. N. W. 48 miles, and N. E. $\frac{1}{2}$ E. 85 miles. Required the latitude and longitude come to.

Middle Latitude Sailing.

Courses.	Dist.	Diff. of Latitude.		Departure.	
		N.	S.	E.	W.
S. W. *by* S.....	54	...	44·9	...	30·0
W. *by* N.....	63	12·3	...	...	61·8
N. N. W.....	48	44·4	...	...	18·4
N. E. $\frac{1}{2}$ E.....	85	53·9	...	65·7	...
		110·6	44·9	65·7	110·2
		44·9	...	...	65·7
			...	...	
N. 34° W.....	79	65·7 = 1	6 N.		44·5

Latitude of Cape Clear.....51 18 N.

Latitude come to..... 52 24 N.
Sum 103 42
Middle latitude..... 51 51

Now, to middle latitude 51° 51′ or 52°, and departure 44·5 in a latitude column, the difference of longitude is 72 in a distance column.

Longitude of Cape Clear..... 9° 46′ W.
Difference of longitude..... 1 12 W.

Longitude come to..... 10° 58′ W.

The above method is that always practised to find the difference of longitude made good in the course of a day's run, and will, no doubt, give the difference of longitude tolerably exact in any probable run a ship may make in that time, especially near the equator. But in a high latitude, when the distances are considerable, this method is not to be depended on. To illustrate this, let a ship be supposed to sail from latitude 57° N., as follows: E. 240 miles, N. 240 miles, W. 240 miles, and S. 240 miles; then, by the above method, the ship will be come to the same place she left. It will, however, appear evident from the following consideration, that this is by no means the case; for let two ships, from latitude 61° N., and distant 240 miles, sail directly south till they are in latitude 57° N.; now, their distance, being computed by Problem IV. of Parallel Sailing, will be 269·6 miles; and therefore, if the ship sailed as above, she will be 29·6 miles west of the place sailed from, and the error in longitude will be equal to $240 \times \overline{\text{secant } 61° - \text{secant } 57°} = 29{\cdot}6 \times \text{secant } 57° = 54{\cdot}4$.

Middle Latitude Sailing.

Theorems might be investigated for computing the errors to which the above method is liable. These corrections may, however, be avoided, by using the following method.

Rule II. Complete the traverse table as before, to which annex five columns; the first column is to contain the several latitudes the ship is in at the end of each course and distance; the second, the sums of each following pair of latitude; the third, half the sums, or middle latitudes; and the fourth and fifth columns are to contain the differences of longitude.

Now find the difference of longitude answering to each middle latitude and its corresponding departure, and put them in the east or west difference of longitude columns, according to the name of the departure. Then the difference of the sums of the east and west columns will be the difference of longitude made good, of the same name with the greater.

Example. A ship from Halliford in Iceland, in lat. 64° 30′ N., long. 27° 15′ W., sailed as follows: S. S. W. 46 miles, S. W. 61 miles, S. *by* W. 59 miles, S. E. *by* E. 86 miles, S. *by* E. $\frac{1}{2}$ E. 76 miles. Required the lat. and long. come to.

Traverse Table.

Courses.	Dist.	Diff. of Lat.		Departure.	
		N.	S.	E.	W.
S. S. W.....	46	...	42·5	...	17·6
S. W.....	61	...	43·1	...	43·1
S. *by* W.....	59	...	57·9	...	11·5
S. E. *by* E.....	86	...	47·8	71·5	...
S. *by* E. $\frac{1}{2}$ E.....	76	...	72·7	22 0	...
	...	...	264·0	93·5	72·2
				72·2	
				21·3	

By Rule I.

Latitude Halliford..... 64° 30′ N.
Difference of latitude..... 4 24 S.

Latitude in..... 60 6 N.
Sum 124 36
Middle latitude..... 62 18
Now, to middle latitude 62° 18′, and departure 21·3, the difference of longitude is..... 46 E.
Longitude Halliford..... 27 15 W.

Longitude in..... 26 29
The error of common method in this example is 12′.

Longitude Table.

Successive Latitudes.	Sums.	Middle Latitudes.	Diff. of Long.	
			E.	W.
64° 30′	... ...	... ...	...	...
63 48	128° 18′	64° 9′	...	40·4
63 5	126 53	63 27	...	96·4
62 7	125 12	62 36	...	25·0
61 19	123 26	61 43	150·9	...
60 6	121 25	60 43	45·0	...
... ...	... ...	... ...	195·9	161·8
			161·8	
			34·1 E.	

Difference of longitude..... 34·1 E.
Longitude Halliford..... 27 15·0 W.

Longitude in..... 26 40·9 W.

Mercator's Sailing.

CHAP. VI.—OF MERCATOR'S SAILING.

It was observed, in Middle Latitude Sailing, that the difference of longitude made upon an oblique rhumb could not be exactly determined by using the middle latitude. In Mercator's Sailing the difference of longitude is very easily found, and the several problems of sailing are resolved with the utmost accuracy, by the assistance of Mercator's chart or equivalent tables.

In Mercator's chart, the meridians are straight lines parallel to each other; and the degrees of latitude, which at the equator are equal to those of longitude, increase with the distance of the parallel from the equator. The parts of the meridian thus increased are called *meridional parts*. A table of these parts was first constructed by Mr Edward Wright, by the continual addition of the secants of each minute of latitude.

For by parallel sailing,

R : cos. of lat. : : part of equat. : similar part of parallel.

And because the equator and meridian on the globe are equal; therefore,

R : cos. lat. :: part of meridian : similar part of parallel.

Or sec. lat. : R :: part of merid. : similar part of parallel.

$$\text{Hence } \frac{\text{secant latitude}}{\text{part of meridian}} = \frac{\text{R}}{\text{part of parallel}}.$$

But in Mercator's chart the parallels of latitude are equal, and radius is a constant quantity. If, therefore, the latitude be assumed successively equal to '1′, 2′, 3′,' &c. and the corresponding parts of the enlarged meridian be represented by *a*, *b*, *c*, &c.; then,

$$\frac{\text{secant } 1'}{\text{part of mer. } a} = \frac{\text{secant } 2'}{\text{part of mer. } b} = \frac{\text{secant } 3'}{\text{part of mer. } c, \&c.}$$

Hence secant 1′ : part of mer. *a* : : secant 2′ : part of mer. *b* : : secant 3′ : part of mer. *c*, &c.

Therefore, by 12th V. Euclid,

Secant 1′ : part of mer. *a* : : secant 1′ + secant 2′ + secant 3′, &c. : parts of *a* + *b* + mer. *c*, &c.

That is, the meridional parts of any given latitude are equal to the sum of the secants of the minutes in that latitude.[1]

Since CD : LK : : R : secant LD, fig. 15.

And in the triangle CED,

ED : CD : : R : tangent CED;

Therefore ED : LK : : R^2 : secant LD × tangent CED.

$$\text{Hence LK} = \frac{\text{ED} \times \text{sec. LD} \times \text{tang. CED}}{R^2} =$$

$$\frac{\text{ED} \times \text{sec. LD}}{\text{R}} \times \frac{\text{tang. CED}}{\text{R}}.$$

But $\frac{\text{ED} \times \text{sec. LD}}{\text{R}}$ is the enlarged portion of the meridian answering to ED. Now the sum of all the quantities $\frac{\text{ED} \times \text{secant LD}}{\text{R}}$ corresponding to the sum of all the ED's contained in AS, will be the meridional parts answering to the difference of latitude AS; and MN is the sum of all the corresponding portions of the equator LK.

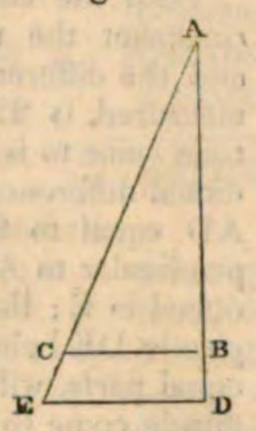
$$\text{Whence MN} = \text{mer. diff. of lat.} \times \text{tangent } \frac{\text{CED}}{\text{R}}.$$

That is, the difference of longitude is equal to the meridional difference of latitude multiplied by the tangent of the course, and divided by the radius.

This equation answers to a right-angled rectilineal triangle, having an angle equal to the course; the adjacent side equal to the meridional difference of latitude, and the opposite side the difference of longitude. This triangle is, therefore, similar to a triangle constructed, with the course and difference of latitude, according to the principles of plane sailing, and the homologous sides will be proportional. Hence, if, in fig. 26, the angle A represents the course, AB the difference of latitude, and if AD be made equal to the meridional difference of latitude, then DE, drawn perpendicular to AD, meeting the distance produced to E, will be the difference of longitude.

Mercator's Sailing.

Fig. 26.



The meridional parts on the terrestrial spheroid of $\frac{1}{300}$th of compression to any latitude *l*, may be found from the following formula. P = 7915′·705 log. tan. $(45° + \frac{1}{2}l)$ — 22′·88 sin. *l* — 0′·0508 sin. 3*l* —, &c.

It is scarcely necessary to observe, that the meridional difference of latitude is found by the same rules as the proper difference of latitude; that is, if the given latitudes be of the same name, the difference of the corresponding meridional parts will be the meridional difference of latitude; but if the latitudes are of a contrary denomination, the sum of these parts will be the meridional difference of latitude.

PROB. I. Given the latitudes and longitudes of two places, to find the course and distance between them.

Ex. Required the course and distance between Cape Finisterre, in latitude 42° 52′ N., longitude 9° 17′ W., and Port Praya in the island of St Jago, in latitude 14° 54′ N., and longitude 23° 29′ W.

Lat. Cape Finisterre,	42° 52′	Mer. parts,	2852
Latitude Port Praya,	14 54	Mer. parts,	904
Difference of lat. =	27 58	Mer. dif. lat.	1948
	1678		

Longitude Cape Finisterre, 9° 17′ W.
Longitude Port Praya, 23 29 W.
Diff. longitude, . 14 12 = 852.

By Construction.

Draw the straight line AD (fig. 26) to represent the meridian of Cape Finisterre, upon which lay off AB, AD equal to 1678 and 1948, the proper and meridional differences of latitude. From D draw DE perpendicular to AD, and equal to the difference of longitude 852; join AE, and draw BC parallel to DE; then the difference AC will measure 1831 miles, and the course BAC 23° 37′.

By Calculation.

To find the course.

As the meridian difference of lat.	1948	.	3·28959
is to the difference of longitude	852	.	2·93044
so is radius			10·00000
to the tangent of the course	23° 37′	.	9·64085

To find the distance.

As radius			10·00000
is to the secant of the course	23° 37′	.	10·03798
so is the difference of latitude	1678	.	3·22479
to the distance . .	1831	.	3·26277

[1] This is not strictly true; for instead of taking the sum of the secants of every minute in the distance of the given parallel from the equator, the sum of the secants of every point of latitude should be taken.

Mercator's Sailing.

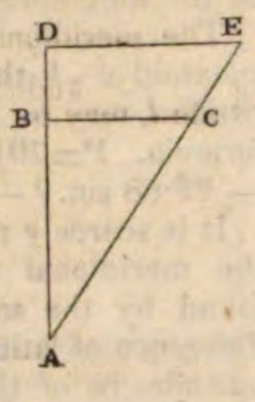
PROB. II. Given the course and distance sailed from a place whose situation is known, to find the latitude and longitude of the place come to.

Example. A ship from Cape Hinlopen in Virginia, in latitude 38° 47′ N., longitude 75° 4′ W., sailed 267 miles N. E. *by* N. Required the ship's present place.

By Construction.

With the course and distance sailed, construct the triangle ABC (fig. 27); and the difference of latitude AB being measured, is 222 miles; hence the latitude come to is 42° 29′ N., and the meridional difference of latitude 293. Make AD equal to 293; and draw DE perpendicular to AD, and meeting AC produced in E; then, the difference of longitude DE being applied to the scale of equal parts, will measure 196: the longitude come to is therefore 71° 48′ W.

Fig. 27.



By Calculation.

To find the difference of latitude.

As radius		10·00000
is to the cosine of the course	3 points .	9·91985
so is the distance . .	267 . .	2·42651
to the difference of latitude .	222 .	2·34636

Lat. Cape Hinlopen, = 38° 47′ N. Mer. parts, 2528
Difference of lat. . 3 42 N.

Latitude come to, . 42 29 N. Mer. parts, 2821

Meridional difference of latitude, 293

To find the difference of longitude.

As radius		10·00000
is to tangent of the course .	3 points .	9·82489
so is the mer. diff. of latitude	293 . .	2·46687
to the difference of longitude	195·8 .	2·29176

Longitude Cape Hinlopen, . 75° 4′ W.
Difference of longitude, . . 3 16 E.

Longitude come to, . . . 71 48 W.

PROB. III. Given the latitudes and bearing of two places, to find their distance and difference of longitude.

Example. A ship from Port Canso in Nova Scotia, in latitude 45° 20′ N., longitude 60° 55′ W., sailed S. E. ¼ S., and, by observation, was found to be in latitude 41° 14′ N. Required the distance sailed and longitude come to.

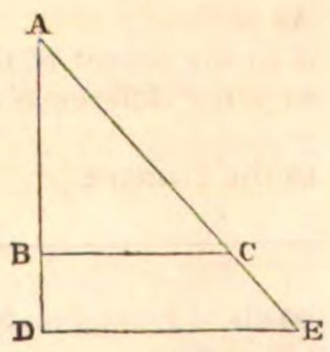
Lat. Port Canso, . 45° 20′ N. . Mer. parts, 3058
Lat. in, by observation, 41 14 N. . Mer. parts, 2720

Difference of lat. . 4 6 = 246 Mer. diff. lat. 338

By Construction.

Fig. 28.

Make AB (fig. 28) equal to 246, and AD equal to 338; draw AE, making an angle with AD equal to 3¾ points, and draw BC, DE perpendicular to AD. Now AC being applied to the scale, will measure 332, and DE 306.



Mercator's Sailing.

By Calculation.

To find the distance.

As radius		10·00000
is to the secant of the course .	3¾ points .	10·13021
so is the difference of latitude .	246 .	2·39093
to the distance . .	332 .	2·52114

To find the difference of longitude.

As radius		10·00000
is to the tangent of the course .	3¾ points	9·95729
so is the mer. diff. of latitude .	338 .	2·52892
to the difference of longitude .	306·3 .	2·48621

Longitude Port Canso, . . 60° 55′ W.
Difference of longitude, . . 5 6 E.

Longitude in, ... 55 49 W.

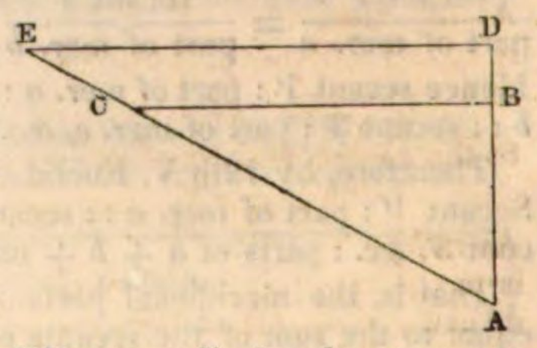
PROB. IV. Given the latitude and longitude of the place sailed from, the course, and departure; to find the distance, and the latitude and longitude, of the place come to.

Example. A ship sailed from Sallee, in latitude 33° 58′ N., longitude 6° 20′ W., the corrected course was N.W. *by* W. ½ W., and departure 420 miles. Required the distance run, and the latitude and longitude come to.

By Construction.

Fig. 29.

With the course and departure construct the triangle ABC (fig. 29); now AC and AB being measured, will be found to be equal to 476 and 224 respectively; hence the latitude come to is 37° 42′ N., and meridional difference of latitude 276. Make AD equal to 276; and draw DE perpendicular thereto, meeting the distance produced in E; then DE applied to the scale will be found to measure 516′. The longitude in is, therefore, 14° 56′ W.



By Calculation.

To find the distance.

As radius		10·00000
is to the cosecant of the course	5½ points .	10·05457
so is the departure . .	420 . .	2·62325
to the distance . . .	476·2 .	2·67782

To find the difference of latitude.

As radius		10·00000
is to the cotangent of the course	5½ points	9·72796
so is the departure . .	420 .	2·62325
to the difference of latitude .	224·5	2·35121

Lat. of Sallee, 33° 58′ N. Mer. parts, 2169
Diff. of lat. 3 44 N.

Latitude in, 37 42 N. Mer. parts, 2445

Mer. difference of latitude, . 276

To find the difference of longitude.

As radius		10·00000
is to the tangent of the course	5½ points .	10·27204
so is the mer. diff. of latitude	276 .	2·44091
to the difference of longitude	516·3 .	2·71295

Mercator's Sailing.

Longitude of Sallee,		6° 20′ W.
Difference of longitude,		8 36 W.
Longitude in,		14 56 W.

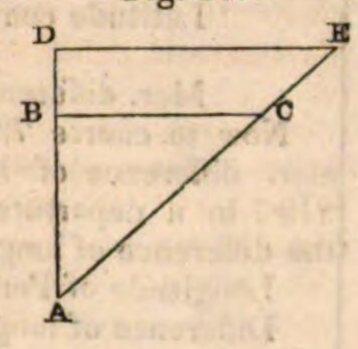
Prob. V. Given the latitudes of two places, and their distance; to find the course and difference of longitude.

Example. A ship from St Mary's, in latitude 36° 57′ N., longitude 25° 9′ W., sailed on a direct course between the north and east 1162 miles, and was then by observation in latitude 49° 57′ N. Required the course steered, and longitude come to.

Lat. of St Mary's,	36° 57′ N.		Mer. parts,	3470
Lat. come to,	49 57 N.		Mer. parts,	2389
Difference of lat.	13 0		Mer. diff. lat.	1081
	780			

By Construction.

Fig. 30.



Make AB equal to 780, and AD equal to 1081; draw BC, DE perpendicular to AD; make AC equal to 1162′, and through AC draw ACE; then the course or angle A being measured, will be found equal 47° 50′, and the difference of longitude DE will be 1194.

By Calculation.

To find the course.

As the distance	1162	3·06521
is to the difference of latitude	780	2·89209
so is radius		10·00000
to the cosine of the course	47° 50′	9·82688

To find the difference of longitude.

As radius		10·00000
is to the tangent of the course	47° 50′	10·04302
so is the mer. diff. of latitude	1081	3·03383
to the difference of longitude	1194	3·07685

Longitude of St Mary's,	25° 9′ W.
Difference of longitude,	19 54 E.
Longitude in,	5 15 W.

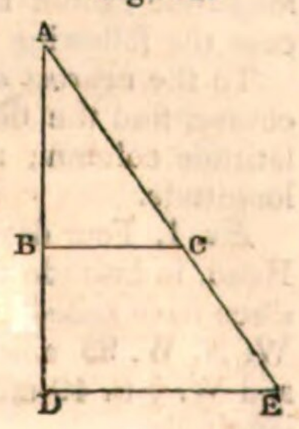
Prob. VI. Given the latitudes of two places, and the departure; to find the course, distance, and difference of longitude.

Example. From Aberdeen, in latitude 57° 9′ N., longitude 2° 8′ W., a ship sailed between the south and east till her departure was 146 miles, and latitude come to 53° 32′ N. Required the course and distance run, and longitude come to.

Latitude Aberdeen,	57° 9′ N.		Mer. parts,	4199
Latitude come to,	53 32 N.		Mer. parts,	3817
Difference of latitude,	3 37 = 217′		Mer. diff. lat.	382

Fig. 31.

By Construction.



With the difference of latitude 217 m. and departure 146 m. construct the triangle ABC; make AD equal to 382, draw DE parallel to BC, and produce AC to E; then the course BAC will measure 33° 56′, the distance AC 261, and the difference of longitude DE 257.

Mercator's Sailing.

By Calculation.

To find the course.

As the difference of latitude	217	2·33646
is to the departure	146	2·16435
so is radius		10·00000
to the tangent of the course	33° 56′	9·82789

To find the distance.

As radius		10·00000
is to the secant of the course	33° 56′	10·08109
so is the difference of latitude	217	2·33646
to the distance	261·5	2·41755

To find the difference of longitude.

As the difference of latitude	217	2·33646
is to the mer. diff. of latitude	382	2·58206
so is the departure	146	2·16435
to the difference of longitude	257	2·40995

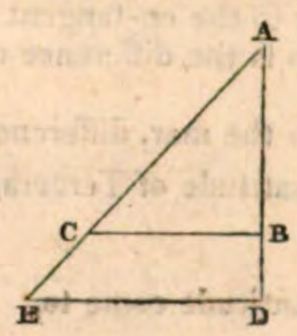
Longitude of Aberdeen,	2° 8′ W.
Difference of longitude,	4 17 E
Longitude come to,	2 9 E.

Prob. VII. Given one latitude, distance, and departure; to find the other latitude, course, and difference of longitude.

Example. A ship from Naples, in latitude 40° 51′ N., longitude 14° 14′ E., sailed 252 miles on a direct course between the south and west, and made 173 miles of westing. Required the course made good, and the latitude and longitude come to.

By Construction.

Fig. 32.



With the distance and departure make the triangle ABC as formerly. Now the course BAC being measured by means of a line of cords, will be found equal to 43° 21′, and the difference of latitude applied to the scale of equal parts will measure 183′; hence the latitude come to is 37° 48′ N., and meridional difference of latitude 237. Make AD equal to 237, and complete the figure, and the difference of longitude DE will measure 224′; hence the longitude in is 10° 30′ E.

By Calculation.

To find the course.

As the distance	252	2·40140
is to the departure	173	2·23805
so is radius		10·00000
to the sine of the course	43° 21′	9·83665

To find the difference of latitude.

As radius		10·00000
is to the cosine of the course	43° 21′	9·86164
so is the distance	252	2·40140
to the difference of latitude	183·2	2·26304

Latitude of Naples,	40° 51′ N.	Mer. parts,	2690
Difference of latitude,	3 3 S.		
Latitude come to,	37 48 N.	Mer. parts,	2453
Meridional difference of latitude,			237

Mercator's Sailing.

To find the difference of longitude.

As radius		10·00000
is to the tangent of the course .	43° 21′ .	9·97497
so is the mer. diff. of latitude .	237 .	2·37475
to the difference of longitude .	223·7 .	2·34972

Longitude of Naples, ...	14° 14′ E.
Difference of longitude, ...	3 44 W.
Longitude in, ...	10 30 E.

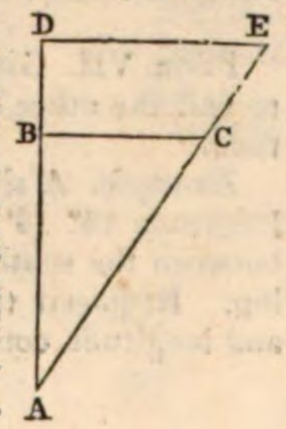
Prob. VIII. Given one latitude, course, and difference of longitude; to find the other latitude and distance.

Example. A ship from Tercera, in latitude 38° 45′ N., longitude 27° 6′ W., sailed on a direct course, which, when corrected, was N. 32° E., and is found by observation to be in longitude 18° 24′ W. Required the latitude come to, and distance sailed.

Longitude of Tercera, ...	27° 6′ W.
Longitude in, ...	18 24 W.
Difference of longitude, ...	8 42 = 522

By Construction.

Fig. 33.



Make the right-angled triangle ADE, having the angle A equal to the course 32°, and the side DE equal to the difference of longitude 522: then AD will measure 835, which, added to the meridional parts of the latitude left, will give those of the latitude come to 48° 46′; hence the difference of latitude is 601: make AB equal thereto, to which let BC be drawn perpendicular; then AC applied to the scale will measure 708 miles.

By Calculation.

To find the meridional difference of latitude.

As radius			10·00000
is to the co-tangent of the course	32° 0′		10·20421
so is the difference of longitude	5 22		2·71767
to the mer. difference of latitude	8352		2·92188
Latitude of Tercera,	38° 45′ N.	Mer. parts,	2526
		Mer. diff. of lat.	835
Latitude come to,	48 46 N.	Mer. parts,	3361
Difference of latitude,	10 1 = 601 miles.		

To find the distance.

As radius			10·00000
is to the secant of the course	32° 0′	.	10·07158
so is the difference of latitude	601	.	2·77887
to the distance . . .	707·7	.	2·85045

Prob. IX. To find the difference of longitude made good upon compound courses.

Rule I. With the several courses and distances complete the traverse table, and find the difference of latitude, departure, and course made good, and the latitude come to, as in Traverse Sailing. Find also the meridional difference of latitude.

Now to the course and meridional difference of latitude, in a latitude column, the corresponding departure will be the difference of longitude, which, applied to the longitude left, will give the ship's present longitude.

Example. A ship from Port St Julian, in latitude 49° 10′ S. longitude 68° 44′ W. sailed as follows: E. S. E. 53 miles, S. E. *by* S. 74 miles, E. *by* N. 68 miles, S. E. *by* E. ½ E. 47 miles, and E. 84 miles. Required the ship's present place.

Mercator's Sailing.

Courses.	Dist.	Diff. of Lat. N.	Diff. of Lat. S.	Departure. E.	Departure. W.
E. S. E.....	53	...	20·3	49·0	
S. E. *by* S.....	74	...	61·5	41·1	
E. *by* N.....	68	13·3	...	66·7	
S. E. *by* E. ½ E.	47	...	22·1	41·5	
E.....	84	...	...	84·0	
		13·3	103·9	282·3	
			13·3		
S. 72° E.....	197		90·6 = 1° 31′		

Latitude left.....49 10 S. m. pt. 3397

Latitude come to.....50 41 S. m. pt. 3539

Mer. difference of latitude..... 142

Now to course 72°, and opposite to 71, half the mer. difference of latitude in a latitude column, is 218·7 in a departure column, which doubled is 437, the difference of longitude.

Longitude of Port St Julian.....68° 44′ W.
Difference of longitude..... 7 17 E.

Longitude come to.....61 27 W.

Although the above method is that usually employed at sea to find the difference of longitude, yet, as it has been already observed, it is not to be depended on, especially in high latitudes, long distances, and a considerable variation in the courses, in which case the following method becomes necessary.

Rule II. Complete the traverse table as before, to which annex five columns. Now, with the latitude left, and the several differences of latitude, find the successive latitudes, which are to be placed in the first of the annexed columns; in the second, the meridional parts corresponding to each latitude is to be put; and in the third, the meridional differences of latitude.

Then to each course, and corresponding meridional difference of latitude, find the difference of longitude, by Prob. IV. which place in the fourth or fifth columns, according as the coast is easterly or westerly; and the difference between the sums of these columns will be the difference of longitude made good upon the whole, of the same name with the greater.

REMARKS.

1. When the course is north or south, there is no difference of longitude.

2. When the course is east or west, the difference of longitude cannot be found by Mercator's Sailing; in this case the following rule is to be used:

To the nearest degree to the given latitude taken as a course, find the distance answering to the departure in a latitude column; this distance will be the difference of longitude.

Ex. 1. Four days ago we took our departure from Faro Head, in latitude 58° 40′ N. and longitude 4° 50′ W. and since have sailed as follows: N. W. 32 miles, W. 69 miles, W. N. W. 93 miles, W. *by* S. 77 miles, S. W. 58 miles, and W. ¾ S. 49 miles. Required our present latitude and longitude.

Method of resolving the Problems of Mercator's Sailing.

Traverse Table.

Courses.	Dist.	Diff. of Lat. N.	Diff. of Lat. S.	Departure. E.	Departure. W.
	...	...	...	...	...
N. W.	32	22·6	...	...	22·6
W.	69	...	...	...	69·0
W. N. W.	93	35·6	...	...	85·9
W. *by* S.	77	...	15·0	...	75·5
S. W.	58	...	41·0	...	41·0
W. ¾ S.	49	...	7·2	...	48·5
		58·2	63·2	...	342·5
			58·2		
W. 1° S.	343		5·0		

Longitude Table.

Successive Latitudes.	Merid. Parts.	Merid. Diff. Lat.	Diff. of Longitude. E.	Diff. of Longitude. W.
58° 40′	4370	...	...	...
59 3	4415	45	...	45·0
59 3	4415	0	...	134·0
59 38	4484	69	...	166·5
59 23	4454	30	...	151·0
58 42	4374	80	...	80·0
58 35	4361	13	...	88·0
			...	664·5

Longitude of Faro Head.....4° 50′ W.
Difference of longitude.....11 4 W.

Longitude in.....15 54 W.

Method of resolving the Problems of Mercator's Sailing.

Ex. 2. A ship from latitude 78° 15′ N. longitude 28° 14′ E. sailed the following courses and distances. The latitude come to is required, and the longitude, by both methods; the bearing and distance of Hacluit's headland, in latitude 79° 55′ N. longitude 11° 55′ E. is also required.

Traverse Table.

Courses.	Dist.	Diff. of Latitude. N.	Diff. of Latitude. S.	Departure. E.	Departure. W.
	...	...	...	...	...
W. N. W.	154	58·9	...	...	142·3
S. W.	96	...	67·9	...	67·9
N. W. ½ W.	89	56·4	...	...	68·8
N. *by* E.	110	107·9	...	21·5	...
N. W. ¾ N.	56	45·0	...	...	33·4
S. *by* E. ¾ E.	78	...	73·4	26·3	...
		268·2	141·3	47·8	312·4
		141·3			47·8
		126·9			264·6

Longitude Table.

Successive Latitudes.	Merid. Parts.	Meridional Diff. of Lat.	Diff. of Longitude. E.	Diff. of Longitude. W.
78° 15′	7817	...	...	...
79 14	8120	303	...	731·7
78 6	7774	346	...	346·0
79 2	8056	282	...	343·6
80 50	8676	620	123·6	...
81 35	8970	294	...	218·0
80 22	8504	466	166·7	...
			290·3	1639·3
				290·3
				1349·0

By Rule I.

Latitude left.....78° 15′ N. Mer. parts.....7817
Diff. of latitude.....2 7 N.

Lat. come to.....80 22 N. Mer. parts.....8504

Meridional diff. of latitude..... 687
As difference of lat.....126·2.....2·10346
is to mer. diff. of lat.....687 .....2·83696
so is the departure.....264·6.....2·42256

to diff. of longitude.....1432.....3·15606

23° 52′ W.
Longitude left.....28 14 E.

Longitude in.....4 22 E.

The error of this method, in the present example, is therefore 1° 23′.

Longitude left.....28° 14′ E.
Difference of longitude.....22 29 W.

Longitude in..... 5 45 E.

To find the bearing and distance of Hacluit's headland.

Lat H. H. = 79° 55′ N. M. P. 8347 Lon. 11° 55′ E.
Lat. ship = 80 22 N. M. P. 8504 Lon. 5 45 E.

Diff. lat. 0 27 M. D. L. 157 D. L. 6 10

370

Now to 78·5 half the meridional difference of latitude, and 185·0 half the difference of longitude, the course 67°, and opposite to the difference of latitude 27, the distance is 69 miles. Hence Hacluit's headland bears S. 67° E. distant 69 miles.

CHAP. VII.—CONTAINING THE METHOD OF RESOLVING THE SEVERAL PROBLEMS OF MERCATOR'S SAILING, BY THE ASSISTANCE OF A TABLE OF LOGARITHMIC TANGENTS.

Prob. I. Given one latitude, distance, and difference of longitude; to find the course and other latitude.

Rule. To the arithmetical complement of the logarithm of the distance add the logarithm of the difference of longitude in minutes, and the log. cosine of the given latitude; the sum, rejecting radius, will be the log. sine of the approximate course.

To the given latitude taken as a course in the traverse table, and half the difference of longitude in a distance column, the corresponding departure will be the first correction of the course, which is subtractive if the given latitude is the least of the two; otherwise additive.

In Table A, under the complement of the course, and

Method of resolving the Problems of Mercator's Sailing.

opposite to the first correction in the side column, is the second correction. In the same table find the number answering to the course at the top, and difference of longitude in the side column; and such part of this number being taken as is found in Table B opposite to the given latitude, will be the third correction. Now these two corrections subtracted from the course corrected by the first correction will give the true course.

Now, the course and distance being known, the difference of latitude is found as formerly.

Oblique Sailing.

	Table A.									Table B.	
Arc.	10°	20°	30°	40°	50°	60°	70°	80°	90°	Lat.	
1°	3′	1′	1′	1′	0′	0′	0′	0′	0′	0°	$\frac{1}{3}$
2	12	6	4	2	2	1	1	0	0	10	$\frac{1}{5}$
3	27	13	8	6	4	3	2	1	0	20	$\frac{1}{6}+\frac{1}{7}$
4	47	23	14	10	7	5	3	1	0	30	$\frac{1}{6}+\frac{1}{8}$
5	74	36	23	16	11	8	5	2	0	40	$\frac{1}{6}+\frac{1}{10}$
6	107	52	33	22	16	11	7	3	0	50	$\frac{1}{4}$
7	145	70	44	30	21	15	9	4	0	60	$\frac{1}{5}$
8	190	92	58	40	28	19	12	6	0	70	$\frac{1}{6}+\frac{1}{30}$
										80, &c.	$\frac{1}{6}$

Example. From latitude 50° N. a ship sailed 290 miles between the south and west, and differed her longitude 5°. Required the course, and latitude come to.

Distance, . .	290	ar. co. log.	7·53760
Diff. of longitude, .	300	log.	2·47712
Latitude, . .	50° 0′	co.	9·80807
Approximate course, .	41 41	sine	9·82279
To lat. 50°, and half diff. long. 150 in a dist. col. the first correction in a dep. col. is 115, .			+ 1 55
Approximate course, .	41 41		
Cor.	1 55		
In Table A to co. course 48° and first corr. 1° 55′, the second direction is .			— 0 2
To course 41° and diff. long. 5°, the number is 15, of which $\frac{1}{3}$ (Table B) being taken, gives			— 0 3
True course, . . .			S. 43 31 W.

To find the difference of latitude.

As radius			10·00000
is to the cosine of the course	43° 33′	.	9·86020
so is the distance . .	290	.	2·46240
to the difference of latitude	210·2	.	2·32260
Latitude left, ...			50° 0′ N.
Difference of latitude, . . .			3 30 S.
Latitude come to, . . .			46 30 N.

This problem was proposed and resolved by Mr Robert Hues, in his Treatise on the Globes, printed at London in the year 1639, p. 181.

It was afterwards proposed by Dr Halley, in the second volume of the *Miscellanea Curiosa*, p. 35, in the following words:

A ship sails from a given latitude, and, having run a certain number of leagues, has altered her longitude by a given angle; it is required to find the course steered. And he then adds: *The solution hereof would be very acceptable, if not to the public, at least to the author of this tract, being likely to open some further light into the mysteries of geometry.*

Since that time, this problem has been solved in an indirect manner, by several writers on navigation, and others; as Monsieur Bouguer, in his *Nouveau Traité de Navigation;* Mr Robertson, in the second volume of his *Elements of Navigation;* Mr Emerson, in his *Theory of Navigation*, which accompanies his *Mathematical Principles of Geography;* Mr Israel Lyons, in the *Nautical Almanac* for 1772; and Monsieur Bezout, in his *Traité de Navigation;* and lately, Baron Maseres, with the assistance of Mr Attwood, has given the first direct solution of this problem. For a comparison of the various solutions which have hitherto been made of this problem, the reader is referred to that by Dr Mackay, in the fourth and sixth volumes of Baron Maseres' *Scriptores Logarithmici.*

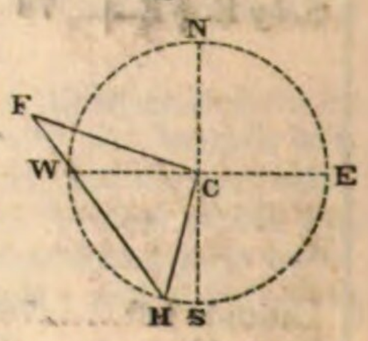
CHAP. VIII.—OF OBLIQUE SAILING.

Oblique sailing is the application of oblique-angled plane triangles to the solution of problems at sea. This sailing will be found particularly useful in going along shore, and in surveying coasts and harbours, &c.

Ex. 1. At 11^h A. M. the Girdle Ness bore W. N. W., and at 2^h P. M. it bore N. W. *by* N.; the course during the interval S. *by* W. five knots an hour. Required the distance of the ship from the Ness at each station.

By Construction.

Fig. 34.



Describe the circle N, E, S, W, and draw the diameters NS, EW at right angles to each other: from the centre C, which represents the first station, draw the W. N. W. line CF; and from the same point draw CH, S. *by* W., and equal to 15 miles, the distance sailed. From H draw HF in a N. W. *by* N. direction, and the point F will represent the Girdle Ness. Now the distances CF, HF will measure 19·1 and 26·5 miles respectively.

By Calculation.

In the triangle FCH are given the distance CH 15 miles, the angle FCH equal to 9 points, the interval between the S. *by* W. and W. N. W. points, and the angle CHF equal to 4 points, being the supplement of the angle contained between the S. *by* W. and N. W. *by* N. points; hence CFH is 3 points; to find the distances CF, HF.

To find the distance CF.

As the sine of CFH	3 points	.	9·74474
is to the sine of CHF	4 points	.	9·84948
so is the distance CH	15 miles	.	1·17609
to the distance CF	19·07,	.	1·28083

To find the distance FH.

As the sine of CFH	3 points	.	9·74474
is to the sine of FCH	points	.	9·99157
so is the distance CH	15 miles	.	1·17609
to the distance FH	26·48,	.	1·42292

Ex. 2. Running up Channel E. *by* S. per compass at the rate of 5 knots an hour. At 11^h A. M. the Eddystone

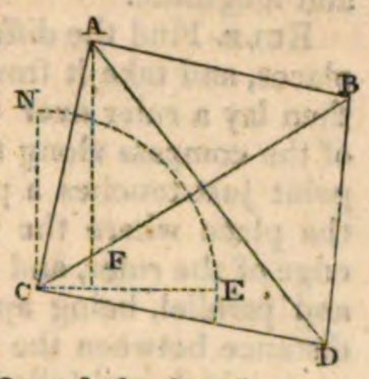
Current Sailing.

lighthouse bore N. *by* E. $\frac{1}{4}$ E., and the Start Point N. E. *by* E. $\frac{1}{4}$ E.; and at 4 P. M. the Eddystone bore N. W. *by* N., and the Start N. $\frac{5}{4}$ E. Required the distance and bearing of the Start from the Eddystone, the variation being $2\frac{1}{4}$ points W.

By Construction.

Let the point C represent the first station, from which draw the N. *by* E. $\frac{1}{4}$ E. line CA, the N. E. *by* E. $\frac{1}{4}$ E. line CB, and the E. *by* S. line CD, which make equal to 25 miles, the distance run in the elapsed time; then from D draw the N. E. *by* N. line DA intersecting CA in A, which represents the Eddystone; and from the same point draw the N. $\frac{3}{4}$ E. line DB cutting CB in B, which therefore represents the Start. Now the distance AB applied to the scale will measure 22·9, and the bearing per compass BAF will measure $73\frac{1}{3}°$.

Fig. 35.



Many other examples might be given. These and all other cases which can occur in practice are to be resolved by plane trigonometry, from calculating the triangles which the *data* of the given case afford.

CHAP. IX.—OF WINDWARD SAILING.

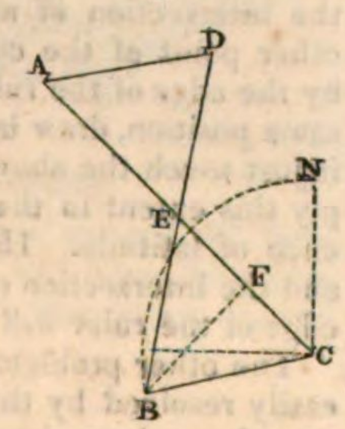
Windward sailing is, when a ship by reason of a contrary wind is obliged to sail on different tacks in order to gain her intended port; and the object of this sailing is to find the proper course and distance to be run on each tack.

Ex. The wind at N. W., a ship bound to a port 64 miles to the windward proposes to reach it on three boards; two on the starboard and one on the larboard tack, and each within 5 points of the wind. Required the course and distance on each tack.

By Construction.

Fig. 36.

Draw the N. W. line CA (fig. 36) equal to 64 miles; from C draw CB W. *by* S., and from A draw AD parallel thereto, and in an opposite direction; bisect AC in E, and draw BED parallel to the N. *by* E. rhumb, meeting CB, AD in the points B and D: then CB = AD applied to the scale will measure $36\frac{1}{4}$ miles, and BD = 2 CB = $72\frac{1}{2}$ miles.



CHAP. X.—OF CURRENT SAILING.

The computations in the preceding chapters have been performed upon the assumption that the water has no motion. This may no doubt answer tolerably well in those places where the ebbings and flowings are regular, as then the effect of the tide will be nearly counterbalanced. But in places where there is a constant current or setting of the sea towards the same point, an allowance for the change of the ship's place arising therefrom must be made. And the method of resolving these problems, in which the effect of a current or heave of the sea is taken into consideration, is called *current sailing*.

In a calm, it is evident a ship will be carried in the direction and with the velocity of the current. Hence, if a ship sails in the direction of the current, her rate will be augmented by the rate of the current; but if sailing directly against it, the distance made good will be equal to the difference between the ship's rate as given by the log and that of the current. And the absolute motion of the ship will be a-head if her rate exceeds that of the current; but if less, the ship will make sternway. If the ship's course be oblique to the current, the distance made good in a given time will be represented by the third side of a triangle, whereof the distance given by the log, and the drift of the current in the same time, are the other sides; and the true course will be the angle contained between the meridian and the line actually described by the ship.

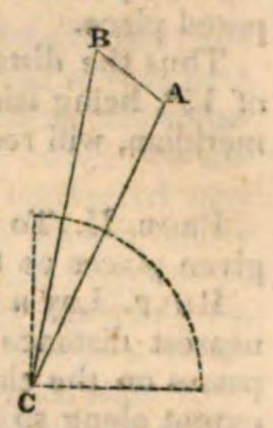
Instruments proposed to solve Problems in Sailing.

Ex. 1. A ship sailed N. N. E. at the rate of 8 knots an hour during 18 hours, in a current setting N. W. *by* W. $2\frac{1}{2}$ miles an hour. Required the course and distance made good.

Fig. 37.

By Construction.

Draw the N. N. E. line CA (fig. 37) equal to 18 × 8 = 144 miles; and from A draw AB parallel to the N. W. *by* W. rhumb, and equal to 18 × $2\frac{1}{2}$ = 45 miles; now BC being joined will be the distance, and NCB the course. The first of these will measure 159 miles and the second 6° 23′.

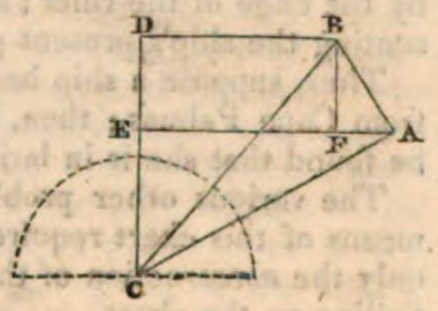


Ex. 2. A ship from latitude 38° 20′ N. sailed 24 hours in a current setting N. W. *by* N., and by account is in latitude 38° 42′ N., having made 44 miles of easting; but the latitude by observation is 38° 58′ N. Required the course and distance made good, and the drift of the current.

By Construction.

Make CE (fig. 38) equal to 22 miles, the difference of latitude by dead reckoning, and EA = 44 miles the departure, and join CA; make CD = 38 miles, the difference of latitude by observation; draw the parallel of latitude DB, and from A draw the N. W. *by* N. line AB, intersecting DB in B, and AB will be the drift of the current in 24 hours: CB being joined, will be the distance made good, and the angle DCB the true course. Now, AB and CB applied to the scale, will measure 19·2 and 50·5 respectively; and the angle DCB will be $41\frac{1}{4}°$.

Fig. 38.



CHAP. XI.—INSTRUMENTS PROPOSED TO SOLVE THE VARIOUS PROBLEMS IN SAILING, INDEPENDENT OF CALCULATION.

Various methods besides those already given have been proposed, to save the trouble of calculation. One of these methods is by means of an instrument composed of rulers, so disposed as to form a right-angled triangle, having numbers in a regular progression marked on their sides. These instruments are made of different materials, such as paper, wood, brass, &c. and are differently constructed, according to the fancy of the inventor. A number of other instruments, very differently constructed, have been proposed for the same purpose; of these, the rectangular instrument by the late A. Mackay, LL.D. F. R. S. E. &c. is one of the best. It is seldom, however, that any of them are used.

Sea-Charts.

CHAP. XII.—OF SEA-CHARTS.

The charts usually employed in the practice of navigation are of two kinds, namely, *Plane* and *Mercator's Charts*. The first of these is adapted to represent a portion of the earth's surface near the equator, and the last for all portions of the earth's surface. For a particular description of these, see the article CHART; and as these are particularly described under the above article, it is therefore sufficient in this place to describe their use.

Use of the Plane Chart.

PROB. I. To find the latitude of a place on the chart.

RULE. Take the least distance between the given place and the nearest parallel of latitude; now this distance applied the same way on the graduated meridian, from the extremity of the parallel, will give the latitude of the proposed place.

Thus the distance between Bonavista and the parallel of 15°, being laid from that parallel upon the graduated meridian, will reach to 16° 5′, the latitude required.

PROB. II. To find the course and distance between two given places on the chart.

RULE. Lay a ruler over the given places, and take the nearest distance between the centre of any of the compasses on the chart and the edge of the ruler; move this extent along so as one point of the compass may touch the edge of the ruler, and the straight line joining their points may be perpendicular thereto; then will the other point show the course. The interval between the places, being applied to the scale, will give the required distance.

Thus the course from Palma to St Vincent will be found to be about S. S. W. $\frac{3}{4}$ W. and the distance $13\frac{1}{4}°$, or 795 miles.

PROB. III. The course and distance sailed from a known place being given, to find the ship's place on the chart.

RULE. Lay a ruler over the place sailed from parallel to the rhumb, expressing the given course; take the distance from the scale, and lay it off from the given place by the edge of the ruler; and it will give the point representing the ship's present place.

Thus, suppose a ship had sailed S. W. *by* W. 160 miles from Cape Palmas; then, by proceeding as above, it will be found that she is in latitude 2° 57′ N.

The various other problems that may be resolved by means of this chart require no further explanation, being only the construction of the remaining problems in Plane Sailing on the chart.

Use of Mercator's Chart.

The method of finding the latitude and longitude of a place, and the course or bearing between two given places by this chart, is performed exactly in the same manner as in the plane chart, which see.

PROB. I. To find the distance between two given places on the chart.

CASE I. When the given places are under the same meridian.

RULE. The difference or sum of their latitudes, according as they are on the same or on opposite sides of the equator, will be the distance required.

CASE II. When the given places are under the same parallel.

RULE. If that parallel be the equator, the difference or sum of their longitudes is the distance; otherwise, take half the interval between the places, lay it off upwards and downwards on the meridian from the given parallel, and the intercepted degrees will be the distance between the places.

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Or, take an equal extent of a few degrees from the meridian on each side of the parallel, and the number of extents, and parts of an extent, contained between the places, being multiplied by the length of an extent, will give the required distance.

CASE III. When the given places differ both in latitude and longitude.

RULE. Find the difference of latitude between the given places, and take it from the equator or graduated parallel; then lay a ruler over the two places, and move one point of the compass along the edge of the ruler until the other point just touches a parallel; then the distance between the place where the point of the compass rested by the edge of the ruler, and the point of intersection of the ruler and parallel, being applied to the equator, will give the distance between the places in degrees and parts of a degree, which multiplied by 60 will reduce it to miles.

PROB. II. Given the latitude and longitude in, to find the ship's place on the chart.

RULE. Lay a ruler over the given latitude, and lay off the given longitude from the first meridian by the edge of the ruler, and the ship's present place will be obtained.

PROB. III. Given the course sailed from a known place, and the latitude in, to find the ship's present place on the chart.

RULE. Lay a ruler over the place sailed from, in the direction of the given course, and its intersection with the parallel of latitude arrived at will be the ship's present place.

PROB. IV. Given the latitude of the place left, and the course and distance sailed, to find the ship's present place on the chart.

RULE. The ruler being laid over the place sailed from, and in the direction of the given course, take the distance sailed from the equator, put one point of the compass at the intersection of any parallel with the ruler, and the other point of the compass will reach to a certain place by the edge of the ruler. Now this point remaining in the same position, draw in the other point of the compass until it just touch the above parallel when sweeped round; apply this extent to the equator, and it will give the difference of latitude. Hence the latitude in will be known, and the intersection of the corresponding parallel with the edge of the ruler will be the ship's present place.

The other problems of Mercator's Sailing may be very easily resolved by this chart; but as they are of less use than those given, they are therefore omitted, and may serve as an exercise to the student.

BOOK II.

CONTAINING THE METHOD OF FINDING THE LATITUDE AND LONGITUDE OF A SHIP AT SEA, AND THE VARIATION OF THE COMPASS.

CHAP. I.—METHOD OF FINDING THE LATITUDE AT SEA.

SECT. I.—*Of Hadley's Quadrant.*

Hadley's quadrant is the chief instrument in use at present for observing altitudes at sea. The form of this instrument, according to the present mode of construction, is an octagonal sector of a circle, and therefore contains 45 degrees; but because of the double reflection, the limb

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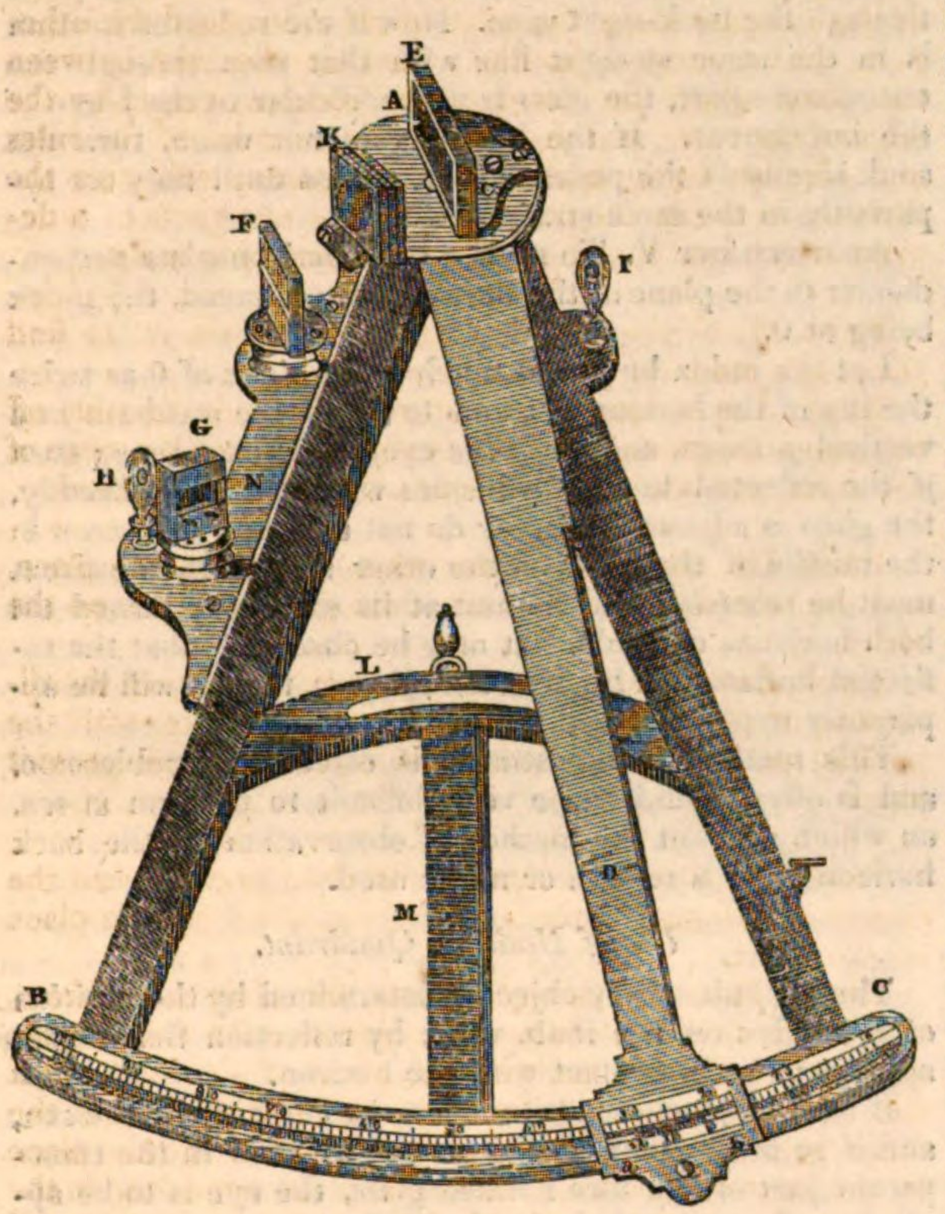
is divided into 90 degrees. See Astronomy and Quadrant. Fig. 39 represents a quadrant of the common construction, of which the following are the principal parts.

1. ABC, the frame of the quadrant.
2. BC, the arch or limb.
3. D, the index; *a b*, the subdividing scale.
4. E, the index-glass.
5. F, the fore horizon-glass.
6. G, the back horizon-glass.
7. K, the coloured or dark glasses.
8. HI, the vanes or sights.

Fig. 39.



Of the Frame of the Quadrant.

The frame of the quadrant consists of an arch BC, firmly attached to the two radii AB, AC, which are bound together by the braces LM, in order to strengthen it, and prevent it from warping.

Of the Index D.

The index is a flat bar of brass, and turns on the centre of the octant: at the lower end of the index there is an oblong opening; to one side of this opening the vernier scale is fixed, to subdivide the divisions of the arch; at the end of the index there is a piece of brass, which bends under the arch, carrying a spring to make the subdividing scale lie close to the divisions. It is also furnished with a screw to fix the index in any desired position. The best instruments have an adjusting screw fitted to the index, that it may be moved more slowly, and with greater regularity and accuracy, than by the hand. It is proper, however, to observe, that the index must be previously fixed near its right position by the above-mentioned screw.

Of the Index-Glass E.

Upon the index, and near its axis of motion, is fixed a plane speculum, or mirror of glass quicksilvered. It is set in a brass frame, and is placed so that its face is perpendicular to the plane of the instrument. This mirror being fixed to the index, moves along with it, and has its direction changed by the motion thereof; and the intention of this glass is to receive the image of the sun, or any other object, and reflect it upon either of the two horizon-glasses, according to the nature of the observation. Of finding the Latitude and Longitude at Sea.

The brass frame with the glass is fixed to the index by the screw *c*; the other screw serves to replace it in a perpendicular position, if by any accident it has been deranged.

Of the Horizon-Glasses F, G.

On the radius AB of the octant are two small speculums: the surface of the upper one is parallel to the index-glass, and that of the lower one perpendicular thereto, when 0 on the index coincides with 0 on the limb. These mirrors receive the reflected rays, and transmit them to the observer.

The horizon-glasses are not entirely quicksilvered; the upper one F is only silvered on its lower half, or that next the plane of the quadrant, the other half being left transparent, and the back part of the frame cut away, that nothing may impede the sight through the unsilvered part of the glass. The edge of the foil of this glass is nearly parallel to the plane of the instrument, and ought to be very sharp, and without a flaw. The other horizon-glass is silvered at both ends. In the middle there is a transparent slit, through which the horizon may be seen.

Each of these glasses is set in a brass frame, to which there is an axis passing through the wood-work, and is fitted to a lever on the under side of the quadrant, by which the glass may be turned a few degrees on its axis, in order to set it parallel to the index-glass. The lever has a contrivance to turn it slowly, and a button to fix it. To set the glasses perpendicular to the plane of the instrument, there are two sunk screws, one before and one behind each glass: these screws pass through the plate on which the frame is fixed, into another plate; so that by loosening one and tightening the other of these screws, the direction of the frame with its mirror may be altered, and set perpendicular to the plane of the instrument.

Of the Coloured Glasses K.

There are usually three coloured classes, two of which are tinged red and the other green. They are used to prevent the solar rays from hurting the eye at the time of observation. These glasses are set in a frame, which turns on a centre, so that they may be used separately or together as the brightness of the sun may require. The green glass is particularly useful in observations of the moon; it may be also used in observations of the sun, if that object be very faint. In the fore observation, these glasses are fixed as in fig. 39; but when the back observation is used, they are removed to N.

Of the two Sight Vanes, H, I.

Each of these vanes is a perforated piece of brass, designed to direct the sight parallel to the plane of the quadrant. That which is fixed at I is used for the fore, and the other for the back observation. The vane I has two holes, one exactly at the height of the silvered part of the horizon-glass, the other a little higher, to direct the sight to the middle of the transparent part of the mirror.

Of the Divisions on the Limb of the Quadrant.

The limb of the quadrant is divided from right to left into 90 primary divisions, which are to be considered as degrees, and each degree is subdivided into three equal parts, which are therefore of 20 minutes each: the intermediate minutes are obtained by means of the scale of divisions at the end of the index.

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Of the Vernier, or Subdividing Scale.

The dividing scale contains a space equal to 21 divisions of the limb, and is divided into 20 equal parts. Hence the difference between a division on the dividing scale and a division on the limb is one twentieth of a division on the limb, or one minute. The degree and minute pointed out by the dividing scale may be easily found thus.

Observe what minute on the dividing scale coincides with a division on the limb; this division being added to the degree and part of a degree on the limb, immediately preceding the first division on the dividing scale, will be the degree and minute required.

Thus, suppose the fourteenth minute on the dividing scale coincided with a division on the limb, and that the preceding division on the limb to 0 on the vernier was 56° 40′; hence the division shown by the vernier is 56° 54′. A magnifying glass will assist the observer to read off the coinciding divisions with more accuracy.

Adjustments of Hadley's Quadrant.

The adjustments of the quadrant consist in placing the mirrors perpendicular to the plane of the instrument. The fore horizon-glass must be set parallel to the speculum, and the planes of the speculum and back horizon-glass produced must be perpendicular to each other when the index is at 0.

ADJUSTMENT I. To set the index-glass perpendicular to the plane of the quadrant.

Set the index towards the middle of the limb, and hold the quadrant so that its plane may be nearly parallel to the horizon: then look into the index-glass, and if the portion of the limb seen by reflection appears in the same plane with that seen directly, the speculum is perpendicular to the plane of the instrument. If they do not appear in the same plane, the error is to be rectified by altering the position of the screws behind the frame of the glass.

ADJUSTMENT II. To set the fore horizon-glass perpendicular to the plane of the instrument.

Set the index to 0; hold the plane of the quadrant parallel to the horizon; direct the sight to the horizon, and if the horizons seen directly and by reflection are apparently in the same straight line, the fore horizon-glass is perpendicular to the plane of the instrument; if not, one of the horizons will appear higher than the other. Now if the horizon seen by reflection is higher than that seen directly, release the nearest screw in the pedestal of the glass, and screw up that on the farther side, till the direct and reflected horizons appear to make one continued straight line. But if the reflected horizon is lower than that seen directly, unscrew the farthest, and screw up the nearest screw till the coincidence of the horizons is perfect, observing to leave both screws equally tight, and the fore horizon-glass will be perpendicular to the plane of the quadrant.

ADJUSTMENT III. To set the fore horizon-glass parallel to the index-glass, the index being at 0.

Set 0 on the index exactly to 0 on the limb, and fix it in that position by the screw at the under side; hold the plane of the quadrant in a vertical position, and direct the sight to a well-defined part of the horizon; then if the horizon seen in the silvered part coincides with that seen through the transparent part, the horizon-glass is adjusted; but if the horizons do not coincide, unscrew the milled screw in the middle of the lever on the other side of the quadrant, and turn the nut at the end of the lever until both horizons coincide, and fix the lever in this position by tightening the milled screw.

As the position of the glass is liable to be altered by fixing the lever, it will therefore be necessary to re-examine it; and if the horizons do not coincide, it will be necessary either to repeat the adjustment, or rather to find the error of adjustment, or, as it is usually called, the *index error*; which may be done thus:

Direct the sight to the horizon, and move the index until the reflected horizon coincides with that seen directly; then the difference between 0 on the limb and 0 on the vernier is the index error; which is additive when the beginning of the vernier is to the right of 0 on the limb, otherwise subtractive.

ADJUSTMENT IV. To set the back horizon-glass perpendicular to the plane of the instrument.

Put the index to 0; hold the plane of the quadrant parallel to the horizon, and direct the sight to the horizon through the back-sight vane. Now if the reflected horizon is in the same straight line with that seen through the transparent part, the glass is perpendicular to the plane of the instrument. If the horizons do not unite, turn the sunk screws in the pedestal of the glass until they are apparently in the same straight line.

ADJUSTMENT V. To set the back horizon-glass perpendicular to the plane of the index-glass produced, the index being at 0.

Let the index be put as much to the right of 0 as twice the dip of the horizon amounts to; hold the quadrant in a vertical position, and apply the eye to the back vane; then if the reflected horizon coincides with that seen directly, the glass is adjusted; if they do not coincide, the screw in the middle of the lever on the other side of the quadrant must be released, and the nut at its extremity turned till both horizons coincide. It may be observed, that the reflected horizon will be inverted; that is, the sea will be apparently uppermost and the sky lowermost.

This method of adjustment is esteemed troublesome, and is often found to be very difficult to perform at sea, on which account the method of observation by the back horizon-glass is seldom or never used.

Use of Hadley's Quadrant.

The altitude of any object is determined by the position of the index on the limb, when by reflection that object appears to be in contact with the horizon.

If the object whose altitude is to be observed be the sun, and if so bright that its image may be seen in the transparent part of the fore horizon-glass, the eye is to be applied to the upper hole in the sight-vane; otherwise, to the lower hole: and in this case the quadrant is to be held so that the sun may be bisected by the line of separation of the silvered and transparent parts of the glass. The moon is to be kept as nearly as possible in the same position; and the image of the star is to be observed in the silvered part of the glass adjacent to the line of separation of the two parts.

There are two different methods of taking observations with the quadrant. In the first of these the face of the observer is directed towards that part of the horizon immediately under the sun, and is therefore called the *fore observation*. In the other method, the observer's back is to the sun, and it is hence called the *back observation*. This last method of observation is to be used only when the horizon under the sun is obscured, or rendered indistinct by fog or any other impediment.

In taking the sun's altitude, whether by the fore or back observation, the observer must turn the quadrant about upon the axis of vision, and at the same time turn himself about upon his heel, so as to keep the sun always in that part of the horizon-glass which is at the same distance as the eye from the plane of the quadrant. In this way the reflected sun will describe an arch of a parallel circle round the true sun, the convex side of which will be downwards in the fore observation and upwards in the back; and consequently, when, by moving the index, the lowest point of

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the arch in the fore observation, or highest in the back, is made to touch the horizon, the quadrant will stand in a vertical plane, and the altitude above the visible horizon will be properly observed. The reason of these operations may be thus explained: The image of the sun being always kept in the axis of vision, the index will always show on the quadrant the distance between the sun and any object seen directly which its image appears to touch; therefore, as long as the index remains unmoved, the image of the sun will describe an arch everywhere equidistant from the sun in the heavens, and consequently a parallel circle about the sun as a pole. Such a translation of the sun's image can only be produced by the quadrant's being turned about upon a line drawn from the eye to the sun as an axis. A motion of rotation upon this line may be resolved into two, one upon the axis of vision, and the other upon a line on the quadrant perpendicular to the axis of vision; and consequently a proper combination of these two motions will keep the image of the sun constantly in the axis of vision, and cause both jointly to run over a parallel circle about the sun in the heavens; but when the quadrant is vertical, a line thereon perpendicular to the axis of vision becomes a vertical axis; and as a small motion of the quadrant is all that is wanted, it will never differ much in practice from a vertical axis. The observer is directed to perform two motions rather than the single one equivalent to them on a line drawn from the eye to the sun; because we are not capable, while looking towards the horizon, of judging how to turn the quadrant about upon the elevated line going to the sun as an axis, by any other means than by combining the two motions above mentioned, so as to keep the sun's image always in the proper part of the horizon-glass. When the sun is near the horizon, the line going from the eye to the sun will not be far removed from the axis of vision; and consequently the principal motion of the quadrant will be performed on the axis of vision, and the part of motion made on the vertical axis will be but small. On the contrary, when the sun is near the zenith, the line going to the sun is not far removed from a vertical line, and consequently the principal motion of the quadrant will be performed on a vertical axis, by the observer's turning himself about, and the part of the motion made on the axis of vision will be but small. In intermediate altitudes of the sun, the motions of the quadrant on the axis of vision, and on the vertical axis, will be more equally divided.

Observations taken with the quadrant are liable to errors, arising from the bending and elasticity of the index, and the resistance it meets with in turning round its centre; whence the extremity of the index, on being pushed along the arch, will sensibly advance before the index-glass begins to move, and may be seen to recoil when the force acting on it is removed. Mr Hadley seems to have been apprehensive that his instrument would be liable to errors from this cause; and, in order to avoid them, gives particular directions that the index be made broad at the end next the centre, and that the centre, or axis itself, have as easy a motion as is consistent with steadiness; that is, an entire freedom from looseness, or *shake* as the workmen term it. By strictly complying with these directions the error in question may indeed be greatly diminished; so far, perhaps, as to render it nearly insensible, where the index is made strong, and the proper medium between the two extremes of a shake at the centre on one hand, and too much stiffness there on the other, is nicely hit: but it cannot be entirely corrected; for to more or less of bending the index will always be subject, and some degree of resistance will remain at the centre, unless the friction there could be totally removed, which is impossible.

Of the reality of the error to which he is liable from this cause, the observer, if he is provided with a quadrant furnished with a screw for moving the index gradually, may thus satisfy himself. After finishing the observation, lay the quadrant on a table, and note the angle; then cautiously loosen the screw which fastens the index, and it will immediately, if the quadrant is not remarkably well constructed, be seen to start from its former situation, more or less according to the perfection of the joint and the strength of the index. This starting, which is owing to the index recoiling after being released from the confined state it was in during the observation, will sometimes amount to several minutes; and its direction will be opposite to that in which the index was moved by the screw at the time of finishing the observation. But how far it affects the truth of the observation, depends on the manner in which the index was moved in setting it to 0, for adjusting the instrument; or in finishing the observations necessary for finding the index error.

The easiest and best rule to avoid these errors seems to be this: In all observations made by Hadley's quadrant, let the observer take notice constantly to finish his observations by moving the index in the same direction which was used in setting it to 0 for adjusting, or in the observations necessary for finding the index error. If this rule is observed, the error arising from the spring of the index will be obviated. For as the index was bent the same way, and in the same degree, in adjusting as in observing, the truth of the observations will not be affected by this bending.

To take Altitudes by the Fore Observation.

1. *Of the Sun.*

Turn down either of the coloured glasses before the horizon-glass, according to the brightness of the sun; direct the sight to that part of the horizon which is under the sun, and move the index until the coloured image of the sun appear in the horizon-glass; then give the quadrant a slow vibratory motion about the axis of vision; move the index until the lower or upper limb of the sun is in contact with the horizon at the lowest part of the arch described by this motion, and the degrees and minutes shown by the index on the limb will be the altitude of the sun.

2. *Of the Moon.*

Put the index to 0, turn down the green glass, place the eye at the lower hole in the sight-vane, and observe the moon in the silvered part of the horizon-glass; move the index gradually, and follow the moon's reflected image until the enlightened limb is in contact with the horizon at the lower part of the arch described by the vibratory motion as before, and the index will show the altitude of the observed limb of the moon. If the observation is made in the day-time, the coloured glass is unnecessary.

3. *Of a Star or Planet.*

The index being put to 0, direct the sight to the star through the lower hole in the sight-vane and transparent part of the horizon-glass; move the plane of the quadrant a very little to the left, and the image of the star will be seen in the silvered part of the glass. Now move the index, and the image of the star will appear to descend; continue moving the index gradually until the star is in contact with the horizon at the lowest part of the arch described, and the degrees and minutes shown by the index on the limb will be the altitude of the star.

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To take Altitudes by the Back Observation.

1. *Of the Sun.*

Put the stem of the coloured glasses into the perforation between the horizon-glasses; turn down either according to the brightness of the sun, and hold the quadrant vertically; then direct the sight through the hole in the back sight-vane, and the transparent slit in the horizon-glass to that part of the horizon which is opposite to the sun; now move the index till the sun is in the silvered part of the glass, and by giving the quadrant a vibratory motion, the axis of which is that of vision, the image of the sun will describe an arch the convex side of which is upwards; bring the limb of the sun, when in the upper part of this arch, in contact with the horizon, and the index will show the altitude of the other limb of the sun.

2. *Of the Moon.*

The altitude of the moon is observed in the same manner as that of the sun, with this difference only, that the use of the coloured glass is unnecessary unless the moon is very bright; and that the enlightened limb, whether it be the upper or lower, is to be brought in contact with the horizon.

3. *Of a Star or Planet.*

Look directly to the star through the vane and transparent slit in the horizon-glass; move the index until the opposite horizon, with respect to the star, is seen in the silvered part of the glass, and make the contact perfect, as formerly. If the altitude of the star is known nearly, the index may be set to that altitude, the sight directed to the opposite horizon, and the observation made as before.

SECT. II.—*Of finding the Latitude of a Place.*

The observation necessary for ascertaining the latitude of a place, is that of the meridional altitude of a known celestial object; or two altitudes when the object is out of the meridian. The latitude is deduced with more certainty and with less trouble from the first of these methods than from the second; and the sun, for various reasons, is the object most proper for this purpose at sea. It, however, frequently happens that, by the interposition of clouds, the sun is obscured at noon, and by this means the meridian altitude is lost. In this case, therefore, the method by double altitudes becomes necessary. The latitude may be deduced from three altitudes of an unknown object, or from double altitudes, the apparent times of observation being given.

The altitude of the limb of an object observed at sea requires four separate corrections in order to obtain the true altitude of its centre; these are for *semidiameter*, *dip*, *refraction*, and *parallax*. (See ASTRONOMY, and the respective articles.) The first and last of these corrections vanish when the observed object is a fixed star.

When the altitude of the lower limb of any object is observed, its semidiameter is to be added thereto in order to obtain the central altitude; but if the upper limb be observed, the semidiameter is to be subtracted. The dip is to be subtracted from, or added to, the observed altitude, according as the fore or back observation is used. The refraction is always to be subtracted from, and the parallax added to, the observed altitude.

TABLE IV.—*Dip of the Horizon.*

Height of Eye.	Dip of Horizon.	Height of Eye.	Dip of Horizon.
Feet.	M. S.	Feet.	M. S.
1	0 57	21	4 22
2	1 21	22	4 28
3	1 39	23	4 34
4	1 55	24	4 40
5	2 8	25	4 46
6	2 20	26	4 52
7	2 31	27	4 58
8	2 42	28	5 3
9	2 52	29	5 9
10	3 1	30	5 14
11	3 10	35	5 39
12	3 18	40	6 2
13	3 26	45	6 24
14	3 34	50	6 44
15	3 42	55	7 4
16	3 49	60	7 23
17	3 56	70	7 59
18	4 3	80	8 32
19	4 10	90	9 3
20	4 16	100	9 33

Of finding the Latitude and Longitude at Sea.

The dip in the preceding table answers to an entirely open and unobstructed horizon. It, however, frequently happens that the sun is over the land at the time of observation, and the ship nearer to the land than the visible horizon would be if unconfined. In this case, the dip will be different from what it would otherwise have been, and is to be taken from the subjoined table, in which the height is expressed at the top, and the distance from the land in the side column in nautical miles. Seamen, in general, can estimate the distance of any object from the ship with sufficient exactness for this purpose, especially when that distance is not greater than six miles, which is the greatest distance of the visible horizon from an observer on the deck of any ship.

TABLE V.—*Dip of the Sea at different Distances from the Observer.*

Distance of Land in Sea Miles.	Height of the Eye above the Sea, in Feet.							
	5	10	15	20	25	30	35	40
	Dip.	Dip.	Dip.	Dip.	Dip.	Dip.	Dip.	Dip.
	M.	M.	M.	M.	M.	M.	M.	M.
0 0¼	11	22	34	45	56	68	79	90
0 0½	6	11	17	22	28	34	39	45
0 0¾	4	8	12	15	19	23	27	30
1 0	4	6	9	12	15	17	20	23
1 0¼	3	5	7	9	12	14	16	19
1 0½	3	4	6	8	10	11	14	15
2 0	2	3	5	6	8	10	11	12
2 0½	2	3	5	6	7	8	9	10
3 0	2	3	4	5	6	7	8	8
3 0½	2	3	4	5	6	6	7	7
4 0	2	3	4	4	5	6	7	7
5 0	2	3	4	4	5	5	6	6
6 0	2	3	4	4	5	5	6	6

Of finding the Latitude and Longitude at Sea.

TABLE VI.—*To reduce the Sun's Declination to any other Meridian, and to any given Time under that Meridian.*

Of finding the Latitude and Longitude at Sea.

Add in W. Sub. in E.	Sub. in W. Add in E.	LONGITUDE. 10°	20°	30°	40°	50°	60°	70°	80°	90°	100°	110°	120°	130°	140°	150°	160°	170°	180°	Add in W. Sub. in E.	Sub. in W. Add in E.
December. 21	21	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	0′0	21	21
20	22	0·0	0·0	0·0	0·0	0·0	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·2	0·2	0·2	0·2	0·2	0·2	20	22
19	23	0·0	0·0	0·1	0·1	0·1	0·1	0·2	0·2	0·2	0·3	0·3	0·3	0·3	0·3	0·4	0·4	0·4	0·4	19	23
18	December. 24	0·0	0·1	0·1	0·1	0·2	0·2	0·2	0·3	0·3	0·4	0·4	0·4	0·5	0·5	0·4	0·6	0·6	0·6	18	24
17	25	0·1	0·1	0·1	0·2	0·2	0·3	0·3	0·4	0·4	0·5	0·5	0·6	0·6	0·7	0·7	0·8	0·8	0·9	17	25
16	26	0·1	0·1	0·2	0·2	0·3	0·4	0·4	0·5	0·5	0·6	0·7	0·7	0·8	0·8	0·9	1·0	1·0	1·1	June. 16	June. 26
15	27	0·1	0·1	0·2	0·3	0·4	0·4	0·5	0·6	0·7	0·8	0·8	0·9	0·9	1·0	1·1	1·2	1·2	1·3	15	27
14	28	0·1	0·2	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9	0·9	1·0	1·1	1·2	1·3	1·4	1·4	1·5	14	28
13	29	0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9	1·0	1·1	1·2	1·3	1·4	1·5	1·6	1·7	1·8	13	29
12	30	0·1	0·2	0·3	0·4	0·5	0·7	0·8	0·9	1·0	1·1	1·2	1·3	1·4	1·5	1·6	1·7	1·9	2·0	12	30
11	31	0·1	0·2	0·4	0·5	0·6	0·7	0·8	1·0	1·1	1·2	1·3	1·5	1·6	1·7	1·8	1·9	2·1	2·2	11	1
December. 10	January. 1	0·1	0·3	0·4	0·5	0·7	0·8	0·9	1·1	1·2	1·3	1·5	1·6	1·7	1·9	2·0	2·1	2·3	2·4	10	2
9	2	0·1	0·3	0·4	0·6	0·7	0·9	1·0	1·2	1·3	1·5	1·6	1·8	1·9	2·0	2·2	2·3	2·5	2·6	9	3
8	3	0·1	0·3	0·5	0·6	0·8	0·9	1·1	1·3	1·4	1·6	1·7	1·9	2·1	2·2	2·4	2·5	2·7	2·8	8	4
7	4	0·2	0·3	0·5	0·7	0·8	1·0	1·2	1·4	1·5	1·7	1·9	2·0	2·2	2·4	2·6	2·7	2·9	3·1	June. 7	July. 5
6	5	0·2	0·4	0·5	0·7	0·9	1·1	1·3	1·4	1·6	1·8	2·0	2·2	2·4	2·5	2·7	2·9	3·1	3·3	6	6
5	6	0·2	0·4	0·6	0·8	1·0	1·2	1·4	1·5	1·7	1·9	2·1	2·3	2·5	2·7	2·9	3·1	3·3	3·5	5	7
4	7	0·2	0·4	0·6	0·8	1·0	1·2	1·4	1·6	1·8	2·0	2·3	2·5	2·7	2·9	3·1	3·3	3·5	3·7	4	8
3	8	0·2	0·4	0·6	0·9	1·1	1·3	1·5	1·7	1·9	2·2	2·4	2·6	2·8	3·0	3·2	3·5	3·7	3·9	3	9
2	9	0·2	0·4	0·7	0·9	1·1	1·4	1·6	1·8	2·0	2·3	2·5	2·7	3·0	3·2	3·4	3·6	3·9	4·1	2	10
1	10	0·2	0·5	0·7	0·9	1·2	1·4	1·7	1·9	2·1	2·4	2·6	2·9	3·1	3·3	3·6	3·8	4·1	4·3	1	11
November. 30	11	0·2	0·5	0·7	1·0	1·2	1·5	1·7	2·0	2·2	2·5	2·7	3·0	3·2	3·5	3·7	4·0	4·2	4·5	31	12
29	January. 12	0·3	0·5	0·8	1·0	1·3	1·6	1·8	2·1	2·3	2·6	2·9	3·1	3·4	3·6	3·9	4·2	4·4	4·7	30	13
28	13	0·3	0·5	0·8	1·1	1·4	1·6	1·9	2·2	2·4	2·7	3·0	3·3	3·5	3·8	4·1	4·3	4·6	4·9	29	14
27	14	0·3	0·6	0·8	1·1	1·4	1·7	2·0	2·3	2·5	2·8	3·1	3·4	3·7	4·0	4·2	4·5	4·8	5·1	May. 28	July. 15
26	15	0·3	0·6	0·9	1·2	1·5	1·8	2·0	2·3	2·6	2·9	3·2	3·5	3·8	4·1	4·4	4·7	5·0	5·3	27	16
25	16	0·3	0·6	0·9	1·2	1·5	1·8	2·1	2·4	2·7	3·0	3·3	3·6	3·9	4·3	4·6	4·9	5·2	5·5	26	17
24	17	0·3	0·6	0·9	1·3	1·6	1·9	2·2	2·5	2·8	3·1	3·5	3·8	4·1	4·4	4·7	5·0	5·3	5·7	25	18
23	18	0·3	0·6	1·0	1·3	1·6	1·9	2·3	2·6	2·9	3·2	3·6	3·9	4·2	4·5	4·9	5·2	5·5	5·8	24	19
22	19	0·3	0·7	1·0	1·3	1·7	2·0	2·3	2·7	3·0	3·3	3·7	4·1	4·3	4·7	5·0	5·4	5·7	6·0	23	20
21	20	0·3	0·7	1·0	1·4	1·7	2·1	2·4	2·8	3·1	3·4	3·8	4·1	4·5	4·8	5·2	5·5	5·9	6·2	22	21
20	21	0·4	0·7	1·1	1·4	1·8	2·1	2·5	2·8	3·2	3·5	3·9	4·3	4·6	5·0	5·3	5·7	6·0	6·4	21	22
19	22	0·4	0·7	1·1	1·5	1·8	2·2	2·5	2·9	3·3	3·6	4·0	4·4	4·7	5·1	5·5	5·8	6·2	6·6	20	23
November. 18	January. 23	0·4	0·7	1·1	1·5	1·9	2·2	2·6	3·0	3·4	3·7	4·1	4·5	4·9	5·2	5·6	6·0	6·4	6·7	May. 19	July. 24
17	24	0·4	0·8	1·1	1·5	1·9	2·3	2·7	3·1	3·4	3·8	4·2	4·6	5·0	5·4	5·7	6·1	6·5	6·9	18	25
16	25	0·4	0·8	1·2	1·6	2·0	2·3	2·7	3·1	3·5	3·9	4·3	4·7	5·1	5·5	5·9	6·3	6·7	7·1	17	26
15	26	0·4	0·8	1·2	1·6	2·0	2·4	2·8	3·2	3·6	4·0	4·4	4·8	5·2	5·6	6·0	6·4	6·8	7·2	16	27
14	27	0·4	0·8	1·2	1·6	2·1	2·5	2·9	3·3	3·7	4·1	4·5	4·9	5·3	5·8	6·2	6·6	7·0	7·4	15	28
13	28	0·4	0·8	1·3	1·7	2·1	2·5	2·9	3·4	3·8	4·2	4·6	5·0	5·5	5·9	6·3	6·7	7·1	7·6	14	29
11	30	0·4	0·9	1·3	1·7	2·2	2·6	3·1	3·5	3·9	4·4	4·8	5·2	5·7	6·1	6·6	7·0	7·4	7·9	12	31
9	1	0·4	0·9	1·4	1·8	2·3	2·7	3·2	3·6	4·1	4·5	5·0	5·4	5·9	6·4	6·8	7·3	7·7	8·2	10	2
November. 7	3	0·5	0·9	1·4	1·9	2·3	2·8	3·3	3·8	4·2	4·7	5·2	5·6	6·1	6·6	7·0	7·5	8·0	8·5	May. 8	4
5	5	0·5	1·0	1·4	1·9	2·4	2·9	3·4	3·9	4·3	4·8	5·3	5·8	6·3	6·8	7·3	7·7	8·2	8·7	6	6
3	February. 7	0·5	1·0	1·5	2·0	2·5	3·0	3·5	4·0	4·5	5·0	5·5	6·0	6·5	7·0	7·5	8·0	8·5	9·0	4	August. 8
1	9	0·5	1·0	1·5	2·0	2·5	3·1	3·6	4·1	4·6	5·1	5·6	6·1	6·7	7·2	7·7	8·2	8·7	9·2	2	10
October. 30	11	0·5	1·0	1·6	2·1	2·6	3·1	3·7	4·2	4·7	5·3	5·8	6·3	6·8	7·3	7·9	8·4	8·9	9·5	30	12
28	13	0·5	1·1	1·6	2·1	2·7	3·2	3·8	4·3	4·8	5·4	5·9	6·5	7·0	7·5	8·1	8·6	9·1	9·7	April. 28	14
26	15	0·5	1·1	1·6	2·2	2·7	3·3	3·8	4·4	4·9	5·5	6·0	6·6	7·2	7·7	8·2	8·8	9·3	9·9	26	16
24	17	0·6	1·1	1·7	2·2	2·8	3·4	3·9	4·5	5·0	5·6	6·2	6·7	7·3	7·9	8·4	9·0	9·6	10·1	24	18
21	20	0·6	1·1	1·7	2·3	2·9	3·5	4·0	4·6	5·2	5·8	6·3	6·9	7·5	8·1	8·7	9·2	9·8	10·4	21	21
September. 18	October. 23	0·6	1·2	1·8	2·4	3·0	3·5	4·1	4·7	5·3	5·9	6·5	7·1	7·7	8·3	8·9	9·5	10·0	10·6	18	24
15	26	0·6	1·2	1·8	2·4	3·0	3·6	4·2	4·8	5·4	6·0	6·6	7·2	7·9	8·5	9·1	9·7	10·3	10·9	April. 15	August. 27
12	March. 1	0·6	1·2	1·8	2·5	3·1	3·7	4·3	4·9	5·5	6·2	6·8	7·4	8·0	8·6	9·2	9·8	10·5	11·1	12	30
9	4	0·6	1·2	1·9	2·5	3·1	3·7	4·4	5·0	5·6	6·3	6·9	7·5	8·1	8·8	9·4	10·0	10·6	11·3	9	2
6	7	0·6	1·3	1·9	2·5	3·2	3·8	4·4	5·1	5·7	6·3	7·0	7·6	8·2	8·9	9·5	10·1	10·8	11·4	6	5
3	10	0·6	1·3	1·9	2·6	3·2	3·8	4·5	5·1	5·8	6·4	7·0	7·7	8·3	9·0	9·6	10·3	10·9	11·5	3	September. 8
30	13	0·6	1·3	1·9	2·6	3·2	3·9	4·5	5·2	5·8	6·5	7·1	7·7	8·4	9·0	9·7	10·3	11·0	11·6	March. 31	11
27	16	0·7	1·3	1·9	2·6	3·2	3·9	4·5	5·2	5·8	6·5	7·1	7·8	8·4	9·1	9·7	10·4	11·0	11·7	28	14
24	19	0·7	1·3	2·0	2·6	3·2	3·9	4·5	5·2	5·9	6·5	7·2	7·8	8·5	9·1	9·8	10·4	11·1	11·7	25	17
21	22	0·7	1·3	2·0	2·6	3·3	3·9	4·6	5·2	5·9	6·5	7·2	7·8	8·5	9·1	9·8	10·4	11·1	11·7	22	20
Add aft. N. Sub. bef. N.	Sub. aft. N. Add bef. N.	$0^h\frac{2}{3}$	$1^h\frac{1}{3}$	2^h0	$2^h\frac{2}{3}$	$3^h\frac{1}{3}$	4^h0	$4^h\frac{2}{3}$	$5^h\frac{1}{3}$	6^h0	$6^h\frac{2}{3}$	$7^h\frac{1}{3}$	8^h0	$8^h\frac{2}{3}$	$9^h\frac{1}{3}$	10^h0	$10^h\frac{2}{3}$	$11^h\frac{1}{3}$	12^h0	Add aft. N. Sub. bef. N.	Sub. aft. N. Add bef. N.

Time from Noon.

Of finding the Latitude and Longitude at Sea.

PROB. I. To reduce the sun's declination to any given meridian.

RULE. Find the number in the table answering to the longitude in the table nearest to that given, and to the nearest day of the month. Now, if the longitude is west, and the declination increasing, that is, from the 20th of March to the 22d of June, and from the 22d of September to the 22d of December, the above number is to be added to the declination; during the other part of the year, or while the declination is decreasing, this number is to be subtracted. In east longitude the contrary rule is to be applied.

Ex. 1. Required the sun's declination at noon 16th April 1836, in longitude 84° W.

Sun's declination at noon at Greenwich,	10° 14·1′ N.
Number from table, . .	+ 5·0
Reduced declination, . .	10 19·1

Ex. 2. Required the sun's declination at noon 22d March 1836, in longitude 151° E.

Sun's declination at noon at Greenwich,	0° 45·9′ N.
Equation from table, . .	— 9·9
Reduced declination, . . .	0 36·0 N.

PROB. II. Given the sun's meridian altitude, to find the latitude of the place of observation.

RULE. The sun's semidiameter is to be added to or subtracted from the observed altitude, according as the lower or upper limb is observed; the dip answering to the height from Table IV. or V. is to be subtracted if the fore observation is used; otherwise, it is to be added; and the refraction answering to the altitude from Table vol. IV. p. 100, art. ASTRONOMY, is to be subtracted; hence the true altitude of the sun's centre will be obtained. Call the altitude south or north, according as the sun is south or north at the time of observation, which subtracted from 90°, will give the zenith distance of a contrary denomination.

Reduce the sun's declination to the meridian of the place of observation, by Prob. I.; then the sun or difference of the zenith distance and declination, according as they are of the same or of a contrary denomination, will be the latitude of the place of observation, of the same name with the greater quantity.

Ex. 1. October 19, 1836, in longitude 32° E., the meridian altitude of the sun's lower limb was 48° 53′ S.; height of the eye 18 feet. Required the latitude.

Obs. alt. sun's low. limb,	48° 53′ S.	Sun's dec. noon,	9° 55′ S.
Semidiameter, .	+0 16	Equation tab.	— 2
Dip and refraction,	—0 5	Reduced dec.	9 53 S.
True alt. sun's centre,	49 4 S.	Zenith dist.	40 56 N.
		Latitude,	31 3 N.

PROB. III. Given the meridian altitude of a fixed star, to find the latitude of the place of observation.

RULE. Correct the altitude of the star by dip and refraction, and find the zenith distance of the star as formerly; take the declination of the star from the Nautical Almanac, and reduce it to the time of observation. Now, the sum or difference of the zenith distance and declination of the star, according as they are of the same or of a contrary name, will be the latitude of the place of observation.

Ex. 1. December 1, 1836, the meridian altitude of Sirius was 59° 50′ S., height of the eye 14 feet. Required the latitude.

Observed altitude of Sirius, . .	59° 50′ S.
Dip and refraction, . . .	—0 4
True altitude, . . .	59 46 S.
Zenith distance, . . .	30° 14′ N.
Declination, ...	16 30 S.
Latitude, ...	13 44 N.

Of finding the Latitude and Longitude at Sea.

PROB. IV. Given the meridian altitude of a planet, to find the latitude of the place of observation.

RULE. Compute the true altitude of the planet as directed in last problem (which is sufficiently accurate for altitudes taken at sea); take its declination from the Nautical Almanac, and reduce it to the time and meridian of the place of observation; then the sum or difference of the zenith distance and declination of the planet will be the latitude, as before.

Ex. 1. August 7, 1836, the meridian altitude of Saturn was 68° 42′ N., and height of the eye 15 feet. Required the latitude.

Observed altitude of Saturn, . .	68° 42′ N.
Dip and refraction, . . .	—0 4
True altitude, ...	68 38 N.
Zenith distance, ...	21 22 S.
Declination, ...	9 8 S.
Latitude, ...	30 30 S.

PROB. V. Given the meridian altitude of the moon, to find the latitude of the place of observation.

RULE. Take the proportional part of the daily variation of the moon's passing the meridian at Greenwich, answering to the ship's longitude; which being applied to the time of passage given in the Nautical Almanac, will give the time of the moon's passage over the meridian of the ship.

Reduce this time to the meridian of Greenwich; and by means of the Nautical Almanac find the moon's declination, horizontal parallax, and semidiameter at the reduced time.

Apply the semidiameter, dip, and refraction to the observed altitude of the limb, and the apparent altitude of the moon's centre will be obtained; to which add the moon's parallax in altitude (found from Problem VII. of next chapter), and the sum will be the true altitude of the moon's centre; which subtracted from 90°, the remainder is the zenith distance, and the sum or difference of the zenith distance and declination, according as they are of the same or of a contrary name, will be the latitude of the place of observation.

Ex. 1. December 19, 1836, in longitude 30°, W., the meridian altitude of the moon's lower limb was 81° 15′ N., height of the eye 12 feet. Required the latitude.

Time of pass. over the mer. of Greenwich,	= 9h 30′
Equation to this and long. . .	+ 0 4
Time of pass. over mer. ship, . .	9 34
Longitude in time, . . .	2 0
Reduced time, ...	11 34
Moon's dec. at 11h, . . .	= 20° 9′ N.
Eq. to 34m, ...	0 6
Reduced declination, . . .	20 15 N.
Moon's hor. par.	54′ 56″
Moon's semidiameter, . . .	15 0
Observed altitude of the moon's lower limb,	81° 15′ N.
Semidiameter, ...	+ 0 15
Dip, ...	— 0 3
Apparent altitude of the moon's centre,	81 27 N.
Refraction, ...	0 0
Parallax in altitude, ...	+ 0 8
True altitude of the moon's centre, .	81 35 N.
Zenith distance, ...	8 25 S.
Declination, ...	20 15 N.
Latitude, ...	11 50 N.

Of finding the Latitude and Longitude at Sea.

Remark. If the object be on the meridian below the pole at the time of observation, then the sum of the true altitude and the complement of the declination is the latitude of the same name as the declination or altitude.

Ex. 1. July 2, 1836, in longitude 15° W. the altitude of the sun's lower limb at midnight was 8° 58′, height of the eye 18 feet. Required the latitude.

Observed altitude sun's lower limb,	8° 58′
Semidiameter,	+0 16
Dip and refraction,	−0 10
True altitude of sun's centre,	9 4 N.
Compl. declin. reduced to time and place,	66 57 N.
Latitude,	76 1 N.

PROB. VI. Given the latitude by account, the declination and two observed altitudes of the sun, and the interval of time between them, to find the true latitude.

RULE. To the log. secant of the latitude by account, add the log. secant of the sun's declination; the sum, rejecting 20 from the index, is the *logarithm ratio*. To this add the log. of the difference of the natural sines of the two altitudes, and the log. of the half elapsed time from its proper column.

Find this sum in column of middle time, and take out the time answering thereto; the difference between which and the half elapsed time will be the time from noon when the greater altitude was observed.

Take the log. answering to this time from column of rising, from which subtract the log. ratio, the remainder is the logarithm of a natural number; which being added to the natural sine of the greater altitude, the sum is the natural cosine of the meridian zenith distance; from which and the sun's declination the latitude is obtained as formerly.

If the latitude thus found differs considerably from that by account, the operation is to be repeated, using the computed latitude in place of that by account.[1]

Ex. In latitude 49° 48′ N. by account, the sun's declination being 9° 37′ S. at 0h 32m P. M. per watch, the altitude of the sun's lower limb was 28° 32′, and at 2h 41m it was 19° 25′; the height of the eye 12 feet. Required the true latitude.

First observed altit.	28° 32′	Second altitude,	19° 25′
Semidiameter,	+0 16	Semidiameter,	+0 16
Dip and refraction,	−0 5	Dip and refraction,	−0 6
True altitude,	28 43	True altitude,	19 35

Time *per* wat.	Alt. N.	Sines.	Lat by acc. 49° 48′	Secant,	0·19013
0h 32m	28° 43′	48048	Declination, 9 37	Secant,	0·00615
2 41	19 35	33518	Log. ratio, . .		0·19628
2 9	Differ.	14530	Log. . . .		4·16227
1 4 30s	.		Half elapsed time, . .		0·55637
37 0	.		Middle time, . .		4·91492
0 32 30	.		Rising, . . .		3·00164
Natural number,	.	639	.		2·80536

Mer. zenith dist.	60° 52′ N.	Cosine,	48687
Declination,	9 37 S.		
Latitude,	51 15 N.		

As the latitude by computation differs 1° 27′ from that by account, the operation must be repeated.

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Computed latitude,	51° 15′	Secant,	0·20348
Declination,	9 37	Secant,	0·00615
Logarithm ratio, .	.	.	0·20963
Difference of nat. sines,	14530	Log.	4·16227
Half elapsed time,	1h 4m 30s	Log.	0·55637
Middle time,	1 40 20	Log.	4·92827
Rising,	0 35 50	Log.	3·08630
Natural number,	.	753	2·87667
Gr. altitude,	28° 43′ N.	Sine,	48048
Mer. zen. dist.	60 47 N.	Cosine,	48801
Declination,	9 37		
Latitude,	51 10 N.		

As this latitude differs only 5′ from that used in the computation, it may therefore be depended on as the true latitude.

PROB. VII. Given the latitude by account, the sun's declination, two observed altitudes, the elapsed time, and the course and distance run between the observations; to find the ship's latitude at the time of observation of the greater altitude.

RULE. Find the angle contained between the ship's course and the sun's bearing at the time of observation of the least altitude, with which enter the Traverse Table as a course, and the difference of latitude answering to the distance made good will be the reduction of altitude.

Now, if the least altitude be observed in the forenoon, the reduction of altitude is to be applied thereto by addition or subtraction, according as the angle between the ship's course and the sun's bearing is less or more than eight points. If the least altitude be observed in the afternoon, the contrary rule is to be used.

The difference of longitude in time between the observations is to be applied to the elapsed time by addition or subtraction, according as it is east or west. This is, however, in many cases so inconsiderable as to be neglected.

With the corrected altitudes and interval, the latitude by account and sun's declination at the time of observation of the greatest altitude, the computation is to be performed by the last problem.

Remark. If the sun come very near the zenith, the sines of the altitude will vary so little as to make it uncertain which ought to be taken as that belonging to the natural sine of the meridian altitude. In this case the following method will be found preferable.

To the log. rising of the time from noon found as before, add the log. secant of half the sum of the estimated meridian altitude, and greatest observed altitude; from which subtract the log. ratio, its index being increased by 10, and the remainder will be the log. sine of an arch; which added to the greatest altitude, will give the sun's meridian altitude.

[1] This method is only an approximation, and ought to be used under certain restrictions; namely,

The observations must be taken between nine o'clock in the forenoon and three in the afternoon. If both observations be in the forenoon, or both in the afternoon, the interval must not be less than the distance of the time of observation of the greatest altitude from noon. If one observation be in the forenoon and the other in the afternoon, the interval must not exceed four hours and a half; and, in all cases, the nearer the greater altitude is to noon the better.

If the sun's meridian zenith distance be less than the latitude, the limitations are still more contracted. If the latitude be double the meridian zenith distance, the observations must be taken between half past nine in the morning and half past two in the afternoon, and the interval must not exceed three hours and a half. The observations must be taken still nearer to noon if the latitude exceed the zenith distance in a greater proportion. See Mackay's Treatises on the Longitude and Navigation, &c.; Requisite Tables, 3d edit.; Mendoza Rios's Tables; Norie's and Riddle's Treatises on Navigation; &c.

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CHAP. II.—METHOD OF FINDING THE LONGITUDE AT SEA BY LUNAR OBSERVATIONS.

SECT. I.—*Introduction.*

The observations necessary to determine the longitude by this method are, the distance between the sun and moon, the moon and a planet, or the moon and a fixed star near the ecliptic, together with the altitude of each. The planets used in the Nautical Almanac for this purpose are the following:—Venus, Mars, Jupiter, and Saturn. The stars are, *α Arietis, Aldebaran, Pollux, Regulus, Spica Virginis, Antares, α Aquilæ, Fomalhaut,* and *α Pegasi;* and the distances of the moon's centre from the sun, and from one or more of these planets and stars, are contained in the xiiith—xviiith pages of the month, at the beginning of every third hour mean time by the meridian of Greenwich. The distance between the moon and one of these objects is observed with a sextant; and the altitudes of the objects are taken as usual with a Hadley's quadrant.

In the practice of this method, it will be found convenient to be provided with three assistants. Two of these are to take the altitudes of the sun and moon, or moon and star, at the same time that the principal observer is taking the distance between the objects; and the third assistant is to observe the time, and write down the observations. In order to obtain accuracy, it will be necessary to observe several distances, and the corresponding altitudes, the intervals of time between them being as short as possible; and the sum of each divided by the number will give the mean distance and mean altitudes; from which the time of observation at Greenwich is to be computed by the rules to be explained.

If the sun or star from which the moon's distance is observed be at a proper distance from the meridian, the time at the ship may be inferred from the altitude observed at the same time with the distance. In this case the watch is not necessary; but if that object be near the meridian, the watch is absolutely necessary, in order to connect the observations for ascertaining the mean time at the ship and at Greenwich with each other.

An observer without any assistants may very easily take all the observations, by first taking the altitudes of the objects, then the distance, and again their altitudes, and reduce the altitudes to the time of observation of the distance; or, by a single observation of the distance, the time being known from which the altitudes of the bodies may be computed, the longitude may be determined.

A set of observations of the distance between the moon and a star or planet, and their altitudes, may be taken with accuracy during the time of the evening or morning twilight; and the observer, though not much acquainted with the stars, will not find it difficult to distinguish the star from which the moon's distance is to be observed. For the time of observation nearly, and the ship's longitude by account being known, the estimate time at Greenwich may be found; and by entering the Nautical Almanac with the reduced time, the distance between the moon and given star will be found nearly. Now set the index of the sextant to this distance, and hold the plane of the instrument so as to be nearly at right angles to the line joining the moon's cusps; direct the sight to the moon, and, by giving the sextant a slow vibratory motion, the axis of which being that of vision, the star, which is usually one of the brightest in that part of the heavens, will be seen in the transparent part of the horizon-glass.

SECT. II.—*Of the Sextant.*

This instrument is constructed for the express purpose of measuring with accuracy the angular distance between the sun and moon, or between the moon and a planet or fixed star, in order to ascertain the longitude of a place by lunar observations. It is, therefore, made with more care than the quadrant, and has some additional appendages that are wanting in that instrument.

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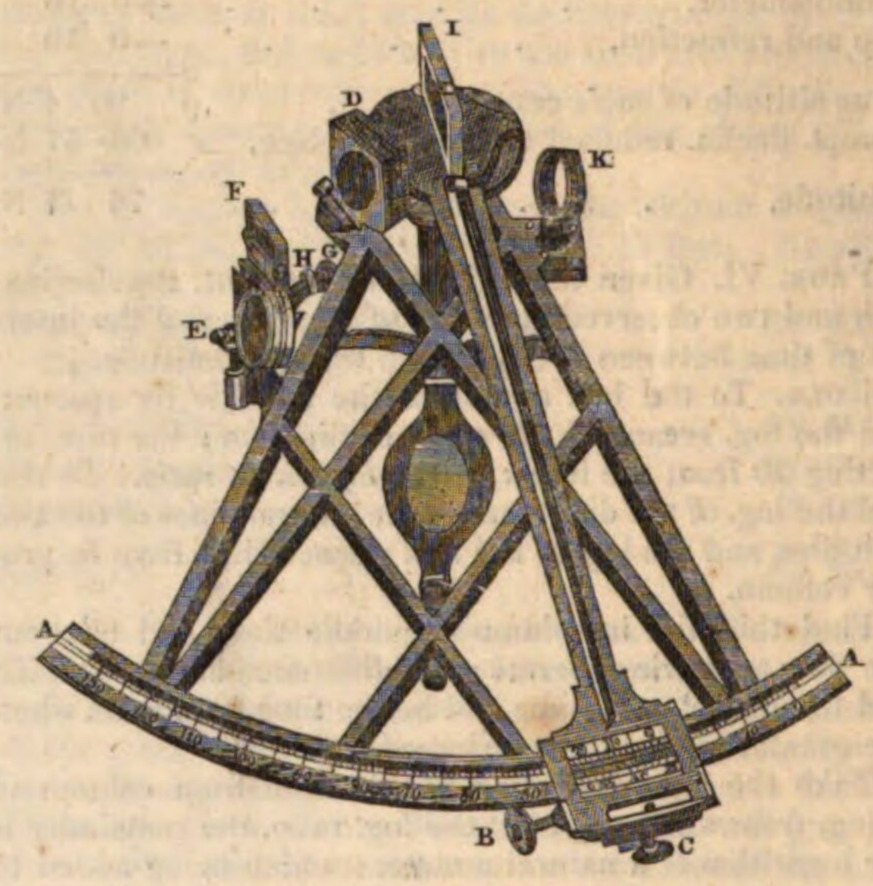
Fig. 40 represents the sextant, so framed as not to be

Fig. 40.



liable to bend. The arch AA is divided into 120 degrees; each degree is divided into three parts; each of these parts, therefore, contains twenty minutes, which are again subdivided by the vernier into every half minute or thirty seconds. The vernier is numbered at every fifth of the longer divisions, from the right towards the left, with 5, 10, 15, and 20; the first division to the right being the beginning of the scale.

In order to observe with accuracy, and make the images come precisely in contact, an adjusting screw B is added to the index, which may thereby be moved with greater accuracy than it can be by the hand; but this screw does not act until the index is fixed by the finger-screw C. Care should be taken not to force the adjusting screw when it arrives at either extremity of its adjustment. When the index is to be moved any considerable quantity, the screw C at the back of the sextant must be loosened; but when the index is brought nearly to the division required, this back screw should be tightened, and then the index may be moved gradually by the adjusting screw.

There are four tinged glasses D, each of which is set in a separate frame that turns on a centre. They are used to defend the eye from the brightness of the solar image and the glare of the moon, and may be used separately or together as occasion requires.

There are three more such glasses placed behind the horizon-glass at E, to weaken the rays of the sun or moon when they are viewed directly through the horizon-glass. The paler glass is sometimes used in observing altitudes at sea, to take off the strong glare of the horizon.

The frame of the index-glass I is firmly fixed by a strong cock to the centre plate of the index. The horizon-glass F is fixed in a frame that turns on the axes or pivots, which move in an exterior frame; the holes in which the pivots move may be tightened by four screws in the exterior frame. G is a screw by which the horizon-glass may be set perpendicular to the plane of the instrument: should this screw become loose, or move too easy, it may be easily tightened by turning the capstan headed screw H, which

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is on one side of the socket through which the stern of the finger-screw passes.

The sextant is furnished with a plain tube without any glasses; and to render the objects still more distinct, it has two telescopes, one representing the objects erect, or in their natural position: the longer one shows them inverted; it has a large field of view, and other advantages, and a little use will soon accustom the observer to the inverted position, and the instrument will be as readily managed by it as by the plain tube alone. By a telescope the contact of the images is more perfectly distinguished; and by the place of the images in the field of the telescope, it is easy to perceive whether the sextant is held in the proper place for observation. By sliding the tube that contains the eye-glasses in the inside of the other tube, the object is suited to different eyes, and made to appear perfectly distinct and well defined.

The telescopes are to be screwed into a circular ring at K; this ring rests on two points against an exterior ring, and is held thereto by two screws: by turning one or other of these screws, and tightening the other, the axis of the telescope may be set parallel to the plane of the sextant. The exterior ring is fixed on a triangular brass stem that slides in a socket, and, by means of a screw at the back of the quadrant, may be raised or lowered so as to move the centre of the telescope to point to that part of the horizon-glass which shall be judged the most fit for observation. Tinged glasses are provided to screw on the eye end of either of the telescopes or the plain tube.

Adjustments of the Sextant.

The adjustments of a sextant are, to set the mirrors perpendicular to its plane and parallel to each other when the index is at zero, and to set the axis of the telescope parallel to the plane of the instrument. The three first of these adjustments are performed nearly in the same manner as directed in the section on the quadrant; as, however, the sextant is provided with a set of coloured glasses placed behind the horizon-glass, the index error may be more accurately determined by measuring the sun's diameter twice, with the index placed alternately before and behind the beginning of the divisions; half the difference of these two measures will be the index error, which must be added to or subtracted from all observations, according as the diameter measured with the index to the left of 0 is less or greater than the diameter measured with the index to the right of the beginning of the divisions. It will be more accurate to measure the sun's horizontal diameter, as the vertical diameter is often affected with refraction.

Adjustment IV.—*To set the Axis of the Telescope parallel to the Plane of the Instrument.*

Turn the eye end of the telescope until the two wires are parallel to the plane of the instrument; and let two distant objects be selected, as two stars of the first magnitude, whose distance is not less than 90° or 100°; make the contact of these objects as perfect as possible at the wire nearest the plane of the instrument; fix the index in this position; move the sextant till the objects are seen at the other wire, and if the same points are in contact, the axis of the telescope is parallel to the plane of the sextant; but if the objects are apparently separated, or do partly cover each other, correct half the error by the screws in the circular part of the supporter, one of which is above and the other between the telescope and sextant; turn the adjusting screw at the end of the index till the limbs are in contact; then bring the objects to the wire next the instrument; and if the limbs are in contact, the axis of the telescope is adjusted; if not, proceed as at the other wire, and continue till no error remains.

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It is sometimes necessary to know the angular distance between the wires of the telescope; to find which, place the wires perpendicular to the plane of the sextant, hold the instrument vertical, direct the sight to the horizon, and move the sextant in its own plane till the horizon and upper wire coincide; keep the sextant in this position, and move the index till the reflected horizon is covered by the lower wire, and the division shown by the index of the limb, corrected by the index error, will be the angular distance between the wires. Other and better methods will readily occur to the observer at land.

Use of the Sextant.

When the distance between the moon and the sun, a planet or a star, is to be observed, the sextant must be held so that its plane may pass through the eye of the observer and both objects; and the reflected image of the most luminous of the two is to be brought in contact with the other seen directly. To effect this, therefore, it is evident, that when the brightest object is to the right of the other, the face of the sextant must be held upwards; but if to the left, downwards. When the face of the sextant is held upwards, the instrument should be supported with the right hand, and the index moved with the left hand. But when the face of the sextant is from the observer, it should oe held with the left hand, and the motion of the index regulated by the right hand.

Sometimes a sitting posture will be found very convenient for the observer, particularly when the reflected object is to the right of the direct one; in this case the instrument is supported by the right hand, the elbow may rest on the right knee, the right leg at the same time resting on the left knee.

If the sextant is provided with a ball and socket, and a staff, one of whose ends is attached thereto, and the other rests in a belt fastened round the body of the observer, the greater part of the weight of the instrument will by this means be supported by his body.

To observe the Distance between the Moon and any Celestial Object.

1. Between the Sun and Moon.

Put the telescope in its place, and the wires parallel to the plane of the instrument; and if the sun is very bright, raise the plate before the silvered part of the speculum; direct the telescope to the transparent part of the horizon-glass, or to the line of separation of the silvered and transparent parts, according to the brightness of the sun, and turn down one of the coloured glasses; then hold the sextant so that its plane produced may pass through the sun and moon, having its face either upwards or downwards, according as the sun is to the right or left of the moon; direct the sight through the telescope to the moon, and move the index till the limb of the sun is nearly in contact with the enlightened limb of the moon; now fasten the index, and by a gentle motion of the instrument make the image of the sun move alternately past the moon; and, when in that position where the limbs are nearest each other, make the coincidence of the limbs perfect by means of the adjusting screw; this being effected, read off the degrees and parts of a degree shown by the index on the limb, using the magnifying glass; and thus the angular distance between the nearest limbs of the sun and moon is obtained.

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2. Between the Moon and a Planet or Star.

Direct the middle of the field of the telescope to the line of separation of the silvered and transparent parts of the horizon-glass; if the moon is very bright, turn down the lightest coloured glass, and hold the sextant so that its plane may be parallel to that passing through the eye of the observer and both objects; its face being upwards if the moon is to the right of the star, but if to the left the face is to be held from the observer; now direct the sight through the telescope to the star, and move the index till the moon appears by the reflection to be nearly in contact with the star; fasten the index, and turn the adjusting screw till the coincidence of the star and enlightened limb of the moon is perfect; and the degrees and parts of a degree shown by the index will be the observed distance between the moon's enlightened limb and the star.

The contact of the limbs must always be observed in the middle between the parallel wires.

It is sometimes difficult for those not much accustomed to observations of this kind, to find the reflected image in the horizon-glass; it will perhaps in this case be found more convenient to look directly to the object, and, by moving the index, to make its image coincide with that seen directly.

Sect. III.—*Of the Circular Instrument of Reflection.*

This instrument was proposed with a view to correct the errors to which the sextant is liable, particularly the error arising from the inaccuracy of the divisions on the limb. It consists of the following parts, a circular ring or limb, two moveable indices, two mirrors, a telescope, coloured glasses, &c.

The limb of this instrument is a complete circle of metal, and is connected with a perforated central plate by six radii; it is divided into 720 degrees, each degree being divided into three equal parts, and the division carried to minutes by means of the index scale as usual.

The two indices are moveable about the same axis, which passes exactly through the centre of the instrument:—the first index carries the central mirror, and the other the telescope and horizon-glass, each index being provided with an adjusting screw for regulating its motion, and a scale for showing the divisions on the limb.

The central mirror is placed on the first index, immediately above the centre of the instrument, and its plane makes an angle of about 30° with the middle line of the index. The four screws in its pedestal for making its plane perpendicular to that of the instrument have square heads, and are therefore easily turned either way by a key for that purpose.

The horizon-glass is placed on the second index near the limb, so that as few as possible may be intercepted of the rays proceeding from the reflected object when to the left. The perpendicular position of this glass is rectified in the same manner as that of the horizon-glass of a sextant, to which it is similar. It has another motion, whereby its plane may be disposed so as to make a proper angle with the axis of the telescope, and a line joining its centre and that of the central mirror.

The telescope is attached to the other end of the index. It is an achromatic astronomical one, and therefore inverts objects; it has two parallel wires in the common focus of the glasses, whose angular distance is between two and three degrees, and which, at the time of observation, must be placed parallel to the plane of the instrument. This is easily done, by making the mark on the eye-piece coincide with that on the tube. The telescope is moveable by two screws in a vertical direction with regard to the plane of the instrument, but is not capable of receiving a lateral motion.

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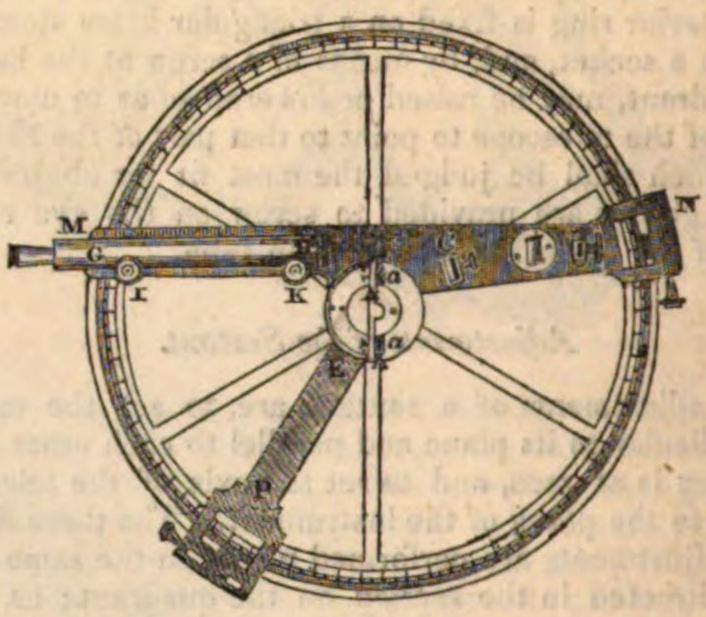
There are two sets of coloured glasses, each set containing four, and differing in shade from each other. The glasses of the larger set, which belongs to the central mirror, should have each about half the degree of shade with which the correspondent glass of the set belonging to the horizon-mirror is tinged. These glasses are kept tight in their places by small pressing screws, and make an angle of about 85° with the plane of the instrument, by which means the image from the coloured glass is not reflected to the telescope. When the angle to be measured is between 5° and 34°, one of the glasses of the largest set is to be placed before the horizon-glass.

The handle is of wood, and is screwed to the back of the instrument, immediately under the centre, with which it is to be held at the time of observation.

Fig. 41 is a plan of the instrument, wherein the limb is represented by the divided circular plate; A is the central

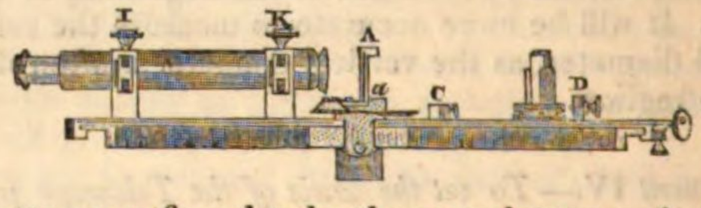
Fig. 41.



mirror; *aa*, the places which receive the stems *aa* of the glass; EF the first or central index, with its scale and adjusting screw; MN the second or horizon-index; GH the telescope; IK the screws for moving it towards or from the plane of the instrument; C the plane of the coloured glass; and D its place in certain observations.

Fig. 42 is a section of the instrument, wherein the se-

Fig. 42.



veral parts are referred to by the same letters as in fig. 41. The circular reflecting instrument was greatly improved by Messrs Mendoza Rios, Troughton, Dollond, &c.

Adjustments of the Circular Instrument.

I. *To set the horizon-glass so that none of the rays from the central mirror shall be reflected to the telescope from the horizon-mirror, without passing through the coloured glass belonging to this last mirror.*—Place the coloured glass before the horizon-mirror; direct the telescope to the silvered part of that mirror, and make it nearly parallel to the plane of the instrument; move the first index; and if the rays from the central mirror to the horizon-glass, and from thence to the telescope, have all the same degree of shade with that of the coloured glass used, the horizon-glass is in its proper position; otherwise, the pedestal of the glass must be turned until the uncoloured images disappear.

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II. Place the two adjusting tools on the limb, about 350° of the instrument distant, one on each side of the division on the left, answering to the plane of the central mirror produced; then, the eye being placed at the upper edge of the nearest tool, move the central index till one half only of the reflected image of this tool is seen in the central mirror towards the left, and move the other tool till its half to the right is hid by the same edge of the mirror; then, if the upper edges of both tools are apparently in the same straight line, the central mirror is perpendicular to the plane of the instrument; if not, bring them into this position by the screws in the pedestal of the mirror.

III. *To set the horizon mirror perpendicular to the plane of the instrument.*—The central mirror being previously adjusted, direct the sight through the telescope to any well-defined distant object; then, if, by moving the central index, the reflected image passes exactly over the direct object, the mirror is perpendicular; if not, its position must be rectified by means of the screws in the pedestal of the glass.

A planet, or star of the first magnitude, will be found a very proper object for this purpose.

IV. *To make the line of collimation parallel to the plane of the instrument.*—Lay the instrument horizontally on a table; place the two adjusting tools on the limb, towards the extremities of one of the diameters of the instrument; and at about fifteen or twenty feet distant let a well-defined mark be placed, so as to be in the same straight line with the tops of the tools; then raise or lower the telescope till the plane, passing through its axis and the tops of the tools, is parallel to the plane of the instrument, and direct it to the fixed object; turn either or both of the screws of the telescope till the mark is apparently in the middle between the wires; then is the telescope adjusted; and the difference, if any, between the divisions pointed out by the indices of the screws will be the error of the indices. Hence this adjustment may in future be easily made.

In this process, the eye-tube must be so placed as to obtain distinct vision.

V. *To find that division to which the second index being placed, the mirrors will be parallel, the central index being at zero.*—Having placed the first index exactly to 0, direct the telescope to the horizon-mirror, so that its field may be bisected by the line of separation of the silvered and transparent parts of that mirror; hold the instrument vertically, and move the second index until the direct and reflected horizons agree; and the division shown by the index will be that required.

This adjustment may be performed by measuring the sun's diameter in contrary directions, or by making the reflected and direct images of a star or planet to coincide.

Use of the Circular Instrument.

To observe the Distance between the Sun and Moon.

I. The sun being to the right of the moon.

Set a proper coloured glass before the central mirror if the distance between the objects is less than 35°; but if above that quantity, place a coloured glass before the horizon-mirror; make the mirrors parallel, the first index being at 0, and hold the instrument so that its plane may be directed to the objects, with its face downwards, or from the observer; direct the sight through the telescope to the moon; move the second index, according to the order of the divisions on the limb, till the nearest limbs of the sun and moon are almost in contact; fasten that index, and make the coincidence of the limbs perfect by the adjusting screw belonging thereto; then invert the instrument, and move the central index towards the second by a quantity equal to twice the arch passed over by that index; direct the plane of the instrument to the objects; look directly to the moon, and the sun will be seen in the field of the telescope; fasten the central index, and make the contact of the same two limbs exact by means of the adjusting screw: Then half the angle shown by the central index will be the distance between the nearest limbs of the sun and moon.

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II. The sun being to the left of the moon.

Hold the instrument with its face upwards, so that its plane may pass through both objects; direct the telescope to the moon, and make its limb coincide with the nearest limb of the sun's reflected image, by moving the second index; now put the instrument in an opposite position; direct its plane to the objects, and the sight to the moon, the central index being previously moved towards the second by a quantity equal to twice the measured distance; and make the same two limbs that were before observed coincide exactly, by turning the adjusting screw of the first index; then half the angle shown by the first index will be the angular distance between the observed limbs of the sun and moon.

To observe the Angular Distance between the Moon and a Fixed Star or Planet.

I. The star being to the right of the moon.

In this case the star is to be considered as the direct object; and the enlightened limb of the moon's reflected image is to be brought in contact with the star or planet, both by a direct and inverted position of the instrument, exactly in the same manner as described in the last article. If the moon's image is very bright, the lightest tinged glass is to be used.

II. The star being to the left of the moon.

Proceed in the same-manner as directed for observing the distance between the sun and moon, the sun being to the right of the moon, using the lightest tinged glass if necessary.

SECT. IV.—*Of the Method of determining the Longitude from Observation.*

PROB. I. To convert degrees or parts of the equator into time.

RULE. Multiply the degrees and parts of a degree by 4, beginning at the lowest denomination, and the product will be the corresponding time; observing that minutes multiplied by 4 produce seconds of time, and degrees multiplied by 4 give minutes.

Ex. Let 26° 45′ be reduced to time.

26° 45′
4

$1^h\ 47^m\ 0^s$ = time required.

PROB. II. To convert time into degrees.

RULE. Multiply the given time by 10, to which add the half of the product. The sum will be the corresponding degrees.

Ex. Let $3^h\ 4^m\ 28^s$ be reduced to degrees.

	3^h	4^m	28^s
			10
	30	44	40
Half =	15	22	20
Corresponding deg. =	46	7	0

PROB. III. Given the time under any known meridian, to find the corresponding time at Greenwich.

RULE. Let the given time be reckoned from the preceding noon, to which the longitude of the place in time is to be applied by addition or subtraction, according as it

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is east or west; and the sum or difference will be the corresponding time at Greenwich.

Ex. What time at Greenwich answers to $6^h\ 15^m$ at a ship in longitude 76° 45′ W.?

Time at ship,	$6^h\ 15^m$
Longitude in time,	5 7 W.
Time at Greenwich,	11 22

Prob. IV. To reduce the time at Greenwich to that under any given meridian.

Rule. Reckon the given time from the preceding noon, to which add the longitude in time if east, but subtract it if west; and the sum or remainder will be the corresponding time under the given meridian.

Ex. What is the expected time of the beginning of the lunar eclipse of February 25, 1793, at a ship in longitude 109° 48′ E.?

Begin. of eclipse at Greenwich per Naut. Alm.	$9^h\ 23^m\ 45^s$
Ship's longitude in time,	7 19 12
Time of beginning eclipse at ship,	16 42 57

Prob. V. Given the latitude of a place, the altitude and declination of the sun, to find the apparent time, and the error of the watch.

Rule. If the latitude and declination are of different names, let their sum be taken; otherwise, their difference. From the natural cosine of this sum or difference, subtract the natural sine of the corrected altitude, and find the logarithm of the remainder; to which add the log. secants of the latitude and declination: the sum will be the log. rising of the horary distance of the object from the meridian, and hence the apparent time will be known. The equation of time being then applied as directed in the Nautical Almanac, the mean time of observation is obtained.

Example. September 15, 1792, in latitude 33° 56′ S. and longitude 18° 22′ E., the mean of the times per watch was $8^h\ 12^m\ 10^s$ A. M., and that of the altitudes of the sun's lower limb 24° 48′; height of the eye 24 feet. Required the error of the watch.

Sun's declin. at noon, per Nautical Almanac,		2° 40·5′ N.	
Equation to $3^h\ 48^m$ A. M.	+ 0 3·7		
Equation to 18° 22′ E.	+ 0 1·2		
Reduced declination,		2 45·4 N.	
Obs. alt. sun's lower limb,		24° 48′	
Semidiameter,	+ 0 16·0		
Dip,	— 0 4·7		
Correction,	— 0 1·9		
True altitude sun's centre,		24 57·4	
Latitude,		33 56	
Declination,		2 45·4	
Sum,		36 41·4	
Secant lat.		0·08109	
Secant dec.		0·00050	
Nat. cosine sum,	80188		
Nat. sine alt.	42193		
Difference,	37995	Log. 4·57973	
Rising 3 48 51		4·66132	
Sun's meridian distance,		$3^h\ 48^m\ 51^s$	
Apparent time,		8 11 9	A. M.
Equation of true, subtract,		0 5 10	
Mean time,		8 5 59	A. M.
Time per watch,		8 12 10	
Watch fast of mean time,		0 6 11	

Prob. VI. Given the latitude of a place, and the altitude of a known fixed star, to find the mean time of observation and error of the watch.

Rule. Correct the observed altitude of the star, and reduce its right ascension and declination to the time of observation.

With the latitude of the place, the true altitude and declination of the star, compute its horary distance from the meridian by last problem; which being added to or subtracted from its right ascension, according as it was observed in the western or eastern hemisphere, the sum or remainder will be the right ascension of the meridian.

From the right ascension of the meridian subtract the sidereal time of mean noon, reduced to the meridian of the place of observation, and obtained from the Nautical Almanac, the remainder will be the approximate time of observation; from which subtract the reduction of sidereal to mean time, answering thereto, the result will be the mean time of observation; and hence the error of the watch will be known.

Ex. December 12, 1836, in latitude 37° 46′ N., and longitude 21° 15′ E., the altitude of Arcturus east of the meridian was 34° 6·4′, the height of the eye 10 feet. Required the apparent time of observation.

Observed alt. of Arcturus,		34° 6·4′		
Dip and refraction,		— 0 4·4		
True altitude,		34 2·0		
Latitude,	37° 46·0′ N.		Sec.	0·10209
Declination,	20 2·0 N.		Sec.	0·02711
Difference,	17 44·0 N.	Co.		95248
Altitude of Arcturus,	34 2·0 N.	Sine,		55968
Difference,			39280	4·59417
Arcturus's merid. dist.		$4^h\ 7^m\ 35^s$	Rising,	4·72337
Arcturus's right asc.		14 8 12		
Right asc. of merid.		10 0 37		
Sidereal time of mean noon,		17 24 37		
Approximate time,		16 36 0		
Reduction of sid. to mean time,		— 0 2 43		
Mean time of obs.		16 33 17		

Prob. VII. Given the apparent altitude of the sun, moon, a planet or star, to find the true altitude.

The altitude obtained from observation corrected for dip and for the semidiameter of the body, if the limb has been observed, is the apparent altitude of the centre.

From the apparent altitude subtract the refraction (Table vol. IV. p. 100, art. Astronomy); and to the remainder add the parallax in altitude; the sum is the true altitude required.

The parallax in altitude is found by adding to the log. cosine of the apparent altitude corrected for refraction, the logarithm of the horizontal parallax; the sum is the logarithm of the parallax in altitude.

The horizontal parallax of the object observed will be found in the Nautical Almanac. The horizontal parallax of the sun may always be supposed 9″. The parallax of a star is insensible.

Ex. The observed altitude of the moon's upper limb was observed 32° 17′, the height of the eye being eighteen feet, the moon's horizontal parallax being 57′ 58″, and semidiameter 16′. Required the apparent and true altitudes.

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Observed altitude,		32°	17′ 0″
Dip,		0	4 0
		32	13 0
Semidiameter,		0	16 0
Apparent altitude of centre,		32	57 0
Refraction,		0	1 33
Cosine,	9·92878	31	55 27
Log. hor. parall. 3478	3·54133		
Log. parallax in altitude,	3·47011		
Parallax in altitude,		+ 0	49 12
True altitude of centre,		32	44 39

Prob. VIII. Given the apparent distance between the moon and the sun or a fixed star or planet, and the apparent and true altitudes of these bodies, to find the true distance.

Rule. To the logarithmic difference answering to the moon's apparent altitude and horizontal parallax, add the logarithmic sines of half the sum, and half the difference of the apparent distance and difference of the apparent altitudes; half the sum will be the logarithmic cosine of an arch: now add the logarithmic sines of the sum and difference of this arch, and half the difference of the true altitudes, and half the sum will be the logarithmic cosine of half the true distance.

Remarks. The apparent distance is found by adding to or subtracting from the observed distance of the limbs the sum of the semidiameters of the bodies (the moon's being increased by the augmentation for her altitude), according as the nearer or more remote limbs have been observed. If a star or the centre of a planet has been observed, no allowance is to be made for the semidiameter of the object. In computing the true altitude from the apparent by the preceding problem, the refraction and parallax should be taken to seconds.

Example. Let the apparent altitude of the moon's centre be 48° 22′, that of the sun's 27° 43′, the apparent central distance 81° 23′ 40″, and the moon's horizontal parallax 58′ 45″. Required the true distance.

Apparent altitude sun's centre,		27°	43′ 0″	Apparent altitude moon's centre,	48° 22′ 0″
Correction,		— 0	1 40	Correction,	+ 0 38 26
Sun's true altitude,		27	41 20	Moon's true altitude,	49 0 26
				Sun's true altitude,	27 41 20
Sun's apparent altitude,		27	43 0		
Moon's apparent altitude,		48	22 0	Difference,	21 19 6
Difference,		20	39 0	Half,	10 39 33
Apparent distance,		81	23 40	Logarithmic difference,	9·994638
Sum,		102	2 40	Half, 51° 1′ 20″ Sine,	9·890639
Difference,		60	44 40	Half, 30 22 20 Sine,	9·703820
Half difference true altitudes,		10	39 33		19·589097
Arch,		51	27 29	Cosine,	9·794548
Sum,		62	7 2	Sine,	9·946417
Difference,		40	47 56	Sine,	9·815183
					19·761600
		40	32 16	Cosine,	9·880800
			2		
True distance,		81	4 32		

This is nearly the method of Borda, similar to Problem XIX. Practical Astronomy, which may be consulted, as well as Problems IV. and XX.

Prob. IX. To find the time at Greenwich answering to a given distance between the moon and the sun, or one of the stars or planets used in the Nautical Almanac.

Rule. If the given distance is found in the Nautical Almanac opposite to the given day of the month, or to that which immediately precedes or follows it, the time is found at the top of the page. But if this distance is not found exactly in the ephemeris, subtract the prop. log. of the difference between the distances which immediately precede and follow the given distance (which prop. log. is given in the Almanac) from the prop. log. of the difference between the given and preceding distances; the remainder will be the prop. log. of the excess of the time corresponding to the given distance, above that answering to the preceding distance; and hence the mean time at Greenwich is known.

Example. September 19, 1836, the true distance between the centres of the sun and moon was 110° 3′ 5″. Required the mean time at Greenwich.

Given distance,	110°	3′	5″		
Dist. at 3 hours,	109	3	58		
Difference,	0	59	7	Prop. log.	4835
				Prop. log. from Almanac,	2578
Excess,	1h	47m	2s	Prop. log.	2257
Preceding time,	3	0	0		
Mean time at Green.	4	47	2		

Prob. X. The latitude of a place and its longitude by account being given, together with the distance between, and the altitude of the moon and the sun, or one of the stars or planets in the Nautical Almanac; to find the true longitude of the place of observation.

Rule. Reduce the estimate time of observation to the meridian of Greenwich by Problem III., and to this time take, from the Nautical Almanac, the moon's horizontal

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parallax and semidiameter. Increase the semidiameter by the augmentation answering to the moon's altitude.

Find the apparent and true altitudes of each object's centre, and the apparent central distance; with which compute the true distance by Problem VIII., and find the mean time at Greenwich answering thereto by the last problem.

If the sun or star be at a proper distance from the meridian at the time of observation of the distance, compute the mean time at the ship. If not, the error of the watch may be found from observations taken either before or after that of the distance.

The difference between the mean times of observation at the ship and Greenwich will be the longitude of the ship in time, which is east or west according as the time at the ship is later or earlier than the Greenwich time.

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Ex. 1. On the 8th of April 1835, at $2^h\ 21^m\ 28^s$ P. M. mean time, in latitude 21° 33′ N. longitude 155° 44′ E. by account, the distance between the sun and moon's nearest limbs was observed to be 111° 16′ 7″, the observed altitude of the sun's lower limb was 53° 8′ 53″, that of the moon's lower limb was 14° 38′ 32″; the height of the eye 20 feet; the barometer being at 29·20 inches, and Fahrenheit's thermometer at 75°. Required the true longitude.

Mean time at ship, 8th,		$2^h\ 21^m\ 28^s$	
Longitude in time E.		10 22 56	
Est. Greenwich time on 7th,		15 58 32	
To est. time sun's semidiameter,			15′ 59″
Moon's semidiam. + aug.			15 4
Moon's eq. hor. par.			57 20
Red. for lat.			— 0 2
Red. hor. par.			57 18

Moon's Right Ascension.		Moon's Declination.		Sidereal Time.	
April 7th, at 15^h,	$8^h\ 46^m\ 59{\cdot}02^s$		22° 28′ 46·7″ N.		$1^h\ 0^m\ 9{\cdot}48$
Prop. part for $58^m\ 32^s$ +	0 2 16·01	—	0 7 10·0	+	0 2 37·46
Red. R. A.	8 49 15·03	Red. dec.	22 21 36·7	Red. S. T.	1 2 46·94
		Pol. dist.	67 38 23·3	24^h — S. T.	22 57 13·06

Sun's obs. alt. lower limb,	53° 8′ 53″	Moon's obs. alt. lower limb,	14° 38′ 32″	Obs. dist. n. l.	111° 16′ 7″
Dip to 20 feet,	— 0 4 26	Dip to 20 feet,	— 0 4 26	Sun's semid. +	0 15 59
				Moon's semid. +	0 15 42
App. alt. lower limb,	53 4 27	App. alt. lower limb,	14 34 6		
Sun's semidiameter,	+ 0 15 59	Moon's semidiameter,	+ 0 15 42	App. central dist.	111 47 48
App. cent. alt.	53 20 26	App. cent. alt.	14 49 48		
Sun's parallax,	+ 0 0 5	Moon's parallax,	+ 0 55 31		
Refraction,	— 0 0 40	Refraction,	— 0 3 24		
Sun's true alt.	53 19 51	Moon's true altitude,	15 41 55		

Apparent central distance,	111° 47′ 48″		
Sun's apparent altitude,	53 20 26	Secant,	0·223984
Moon's apparent altitude,	14 49 48	Secant,	0·014713
Sum,	179 58 2		
Half,	89 59 1	Cosine,	6·456427
Difference of half and distance,	21 48 47	Cosine,	9·967736
Sun's true altitude,	53 19 51	Cosine,	9·776115
Moon's true altitude,	15 41 55	Cosine,	9·983490
Sum,	69 1 46		
Half, or arc 1st,	34 30 53	(Sum)	16·422465
Half, or arc 2d,	89 4 5	Cosine, (Half)	8·211232
Sum of arcs 1st and 2d,	123 34 58	Sine,	9·920691
Difference,	54 33 12	Sine,	9·910974
		(Sum)	19·831665
Half true distance,	55 28 8 2	Sine, (Half)	9·915832
True distance,	110 56 16		

		Difference.		
True distance at 15_h,	110 28 27	0° 27′ 49″	Prop. log.	0·81097
True distance at 18^h,	112 0 10	1 31 43	Prop. log.	0·29282
Proportional par.		$0^h\ 54^m\ 35{\cdot}5^s$	Prop. log.	0·51815
Equation to mean second difference,		+ 0 0 4·5		
Preceding hour,		15 0 0·0		
Greenwich mean time on 7th,		15 54 40·0		

To find the Longitude by a Chronometer.

Moon's true altitude,	15°	41′	55″		
Moon's polar dist.	67	38	23	Cosecant,	0·033947
Ship's latitude,	21	33	0	Secant,	0·031472
Sum,	104	53	18		
				Cosine,	9·784996
Half sum,	52	26	39	Sine,	9·776892
Difference of half sum and alt.	36	44	44		
Meridian dist. west,	18h	35m	0s	Reduced versine,	9·627307
Moon's reduced R. A.	8	49	15		
24h — sidereal time,	22	57	13		
Mean time at ship, 8th,	2	21	28		
Mean time at Greenwich, 7th,	15	54	40		
Longitude,	10	26	48	= 150° 42′ east.	

Remark. In the preceding example, the true distance and mean time at the ship have been computed by methods different from those before given, which would, however, have given the same results.

Variation of the Compass.

CHAP. III.—TO FIND THE LONGITUDE BY MEANS OF A CHRONOMETER.

In order to find the longitude at sea by means of a chronometer, its daily rate on mean solar or sidereal time must be established by observations made at some particular place, and its error ascertained for the meridian of that or of any other known place.

An observatory is the most proper and convenient place for this purpose, as there the rate and error may be both determined with the utmost accuracy by equal altitudes, or transits over the meridian of the sun or stars. But if an observatory is not adjacent, the rate and error of the chronometer may be found by altitudes taken daily for several days from the horizon of the sea, or by the method of reflection from an artificial horizon.

If by these observations the daily rate is found to be nearly the same; that is, if the chronometer gains or loses nearly the same portion of absolute time daily, it may be depended on for finding the longitude; but if its rate is unequal, it must be rejected, as the longitude inferred from it cannot be expected to be accurate.

It would be proper to have two chronometers, and that they should be wound up at different stated times of the day, so that if one should be found stopt, either through neglect in winding up, or otherwise, it may be set by the other, observing to apply the former interval of time between them, and the change in their rates of going in that interval.

PROB. To find the longitude of a ship at sea by a chronometer.

Let several altitudes of the sun, or of any fixed star or planet, be observed, and find the true mean altitude; with which, the ship's latitude, and object's declination, compute the mean time of observation.

To the mean of the times of observation, as shown by the chronometer, apply its error and accumulated rate. Hence the mean time under the meridian of the place where the error and rate were established will be known; to which apply the difference of longitude in time between that place and Greenwich, and the mean time of observation under the meridian of Greenwich will be obtained. The difference between the time at the place of observation and that at Greenwich will be the longitude of the ship in time; and it is east or west, according as the time, by observation, is later or earlier than the Greenwich time.

Ex. May 19, 1804, in latitude 42° 15′ N., five altitudes of the sun's lower limb were observed in the afternoon, the mean being 43° 45′, and the mean of the times of observation, as given by a chronometer, 7h 0m 56s, the chronometer's error having been settled at the Royal Observatory at Greenwich, March 16, at noon, 1m 18s fast for mean time, and daily gain 7s·83, height of the eye twenty-six feet. Required the longitude of the place of observation.

The true altitude of the sun's centre is found to be 43° 55′, with which, the latitude, and sun's declination 19° 51′ N., the sun's meridian distance is found to be 3h 12m 34s, and the equator of time being 3m 51s subtractive, the mean time at the place of observation is 3h 8m 43s.

Time by chronometer,	7h	0m	56s
Error, March 16,	—0	1	18
Accumulated gain (7s·83 × 64⅓),	—0	8	23
Mean time at Greenwich,	6	51	15
Mean time at place of observation,	3	8	43
Longitude in time,	3	42	32

= 55° 38° W.

For various other methods of determining the longitude of a place, the reader is referred to Mackay's Treatise on the Longitude, Inman's, Riddle's, and Norie's Treatises on Navigation; Mendoza Rios's and Thomson's Tables, &c.

CHAP. IV.—OF THE VARIATION OF THE COMPASS.

The variation of the compass is the deviation of the points of the mariner's compass from the corresponding points of the horizon, and is denominated *east* or *west* variation, according as the north point of the compass is to the east or west of the true north point of the horizon.

A particular account of the variation, and of the several instruments used for determining it from observation, may be seen under the articles AZIMUTH, COMPASS, and VARIATION; and for the method of communicating magnetism to compass needles, see MAGNETISM.

PROB. I. Given the latitude of a place, and the sun's magnetic amplitude, to find the variation of the compass.

RULE. To the log. secant of the latitude add the log. sine of the sun's declination, the sun will be the log. cosine of the true amplitude; to be reckoned from the north or south, according as the declination is north or south.

The difference between the true and observed amplitudes, reckoned from the same point, and if of the same name, is the variation; but if of a different name, their sum is the variation.

If the observation be made before noon, the variation will be east or west, according as the observed amplitude is nearer to or more remote from the north than the true amplitude. The contrary rule holds good in observations taken after noon.

Variation of the Compass.

Ex. 1. May 15, 1836, in latitude 33° 10′ N. longitude 18′ W. about 5^h A. M. the sun was observed to rise E. by N. Required the variation.

Sun's dec. May 15, at noon,	18° 58′ N.		
Equation to 7^h from noon,	— 0 4		
Equation to 18° W.,	+0 1		
Reduced declination,	18 55	Sine,	9·51080
Latitude,	33 10	Secant,	0·07723
True amplitude,	N. 67 13 E.	Cosine,	9·58803
Observed amplitude,	N. 78 45 E.		
Variation,	11 32;		

which is *west*, because the observed amplitude is more distant from the north than the true amplitude, the observation being made before noon.

It may be remarked, that the sun's amplitude ought to be observed at the instant the altitude of its lower limb is equal to the sum of 15 minutes and the dip of the horizon. Thus, if an observer be elevated 18 feet above the surface of the sea, the amplitude should be taken at the instant the altitude of the sun's lower limb is 19 minutes.

PROB. II. Given the magnetic azimuth, the altitude and declination of the sun, together with the latitude of the place of observation; to find the variation of the compass.

RULE. Reduce the sun's declination to the time and place of observation, and compute the true altitude of the sun's centre.

Find the sum of the sun's polar distance and altitude and the latitude of the place, take the difference between the half of this sum and the polar distance.

To the log. secant of the altitude add the log. secant of the latitude, the log. cosine of the half sum, and the log. cosine of the difference; half the sum of these will be the log. sine of half the sun's true azimuth, to be reckoned from the south in north latitude, but from the north in south latitude.

The difference between the true and observed azimuths will be the variation as formerly.

Ex. 1. November 18, 1836, in latitude 50° 22′ N. longitude 24° 30′ W. about three quarters past eight A. M. the altitude of the sun's lower limb was 8° 10′, and bearing per compass S. 23° 18′ E.; height of the eye twenty feet. Required the variation of the compass.

Observed altitude of sun's lower limb,	= 0° 10′		
Semidiameter,	+ 0 16		
Dip and refraction,	— 0 10		
True altitude,	8 16		
Sun's declin. 18th November, at noon,	19 25 S.		
Equation to 3¼^h from noon,	— 0 2		
Equation to 24° 30′ W.,	+ 0 1		
Reduced declination,	19 24		
Polar distance,	109° 24′		
Altitude,	8 16	Secant,	0·00454
Latitude,	50 22	Secant,	0·19527
Sum,	168 2		
Half,	84 1	Cosine,	9·01803
Difference,	25 23	Cosine,	0·95591
			19·17375
Half true azimuth,	22 43 2	Sine,	9·58687
True azimuth,	S. 45 26 E.		
Observed azimuth,	S. 23 18 E.		
Variation,	22 8 W.		

Ship's Journal.

CHAP. V.—OF A SHIP'S JOURNAL.

A journal is a regular and exact register of all the various transactions that happen aboard a ship, whether at sea or land, and more particularly that which concerns a ship's way, from whence her place at noon or any other time may be justly ascertained.

That part of the account which is kept at sea is called *sea work*; and the remarks taken down while the ship is in port are called *harbour work*.

At sea, the day begins at noon, and ends at the noon of the following day; the first twelve hours, or those contained between noon and midnight, are denoted by P. M., signifying *after mid-day*; and the other twelve hours, or those from midnight to noon, are denoted by A. M., signifying *before mid-day*. A day's work marked Wednesday, March 6, began on Tuesday at noon, and ended on Wednesday at noon. The days of the week are usually represented by astronomical characters. Thus ☉ represents Sunday; ☽, Monday; ♂, Tuesday; ☿, Wednesday; ♃, Thursday; ♀, Friday; and ♄, Saturday.

When a ship is bound to a port so situated that she will be out of sight of land, the bearing and distance of the port must be found. This may be done by Mercator's or Middle Latitude Sailing; but the most expeditious method is by a chart. If islands, capes, or headlands intervene, it will be necessary to find the several courses and distances between each successively. The true course between the places must be reduced to the course per compass, by allowing the variation to the right or left of the true course, according as it is west or east.

At the time of leaving the land, the bearing of some known place is to be observed, and its distance is usually found by estimation. As perhaps the distance thus found will be liable to some error, particularly in hazy or foggy weather, or when that distance is considerable, it will therefore be proper to use the following method for this purpose.

Let the bearing be observed of the place from which the departure is to be taken; and the ship having run a certain distance on a direct course, the bearing of the same place is to be again observed. Now, having one side of a plain triangle, namely, the distance sailed, and all the angles, the other distances may be found by Prob. I. of Oblique Sailing.

The method of finding the course and distance sailed in a given time is by the compass, the log-line, and half-minute glass. These have been already described. In the royal navy, and in ships in the service of the East India Company, the log is hove once every hour; but in most other trading vessels only every two hours.

The several courses and distances sailed in the course of twenty-four hours, or between noon and noon, and whatever remarks are thought worthy of notice, are set down with chalk on a board painted black, called the *log-board*, which is usually divided into six columns; the first column on the left hand contains the hours from noon to noon; the second and third the knots and parts of a knot sailed every hour, or every two hours, according as the log is marked; the fourth column contains the courses steered; the fifth, the winds; and in the sixth the various remarks and phenomena are written. The log-board is transcribed every day at noon into the log-book, which is ruled and divided after the same manner.

The courses steered must be corrected by the variation of the compass and leeway. If the variation is west, it must be allowed to the left hand of the course steered; but if east, to the right hand, in order to obtain the true course. The leeway is to be allowed to the right or left of the course steered, according as the ship is on the larboard or starboard tack. The method of finding the va-

Ship's Journal.

riation, which should be determined daily if possible, is given in the preceding chapter; and the leeway may be understood from what follows.

When a ship is close hauled, that part of the wind which acts upon the hull and rigging, together with a considerable part of the force which is exerted on the sails, tends to drive her to the leeward. But since the bow of a ship exposes less surface to the water than her side, the resistance will be less in the first case than in the second; the velocity in the direction of her head will therefore in most cases be greater than the velocity in the direction of her side; and the ship's real course will be between the two directions. The angle formed between the line of her apparent course and the line she really describes through the water is called the *angle of leeway*, or simply the *leeway*.

There are many circumstances which prevent the laying down rules for the allowance of leeway. The construction of different vessels, their trim with regard to the nature and quantity of their cargo, the position and magnitude of the sail set, and the velocity of the ship, together with the swell of the sea, are all susceptible of great variation, and very much affect the leeway. The following rules, are, however, usually given for this purpose.

1. When a ship is close hauled, has all her sails set, the water smooth, with a light breeze of wind, she is then supposed to make little or no leeway.
2. Allow one point when the top-gallant sails are handed.
3. Allow two points when under close reefed top-sails.
4. Allow two points and a half when one top-sail is handed.
5. Allow three points and a half when both top-sails are handed.
6. Allow four points when the fore course is handed.
7. Allow five points when under the main-sail only.
8. Allow six points when under balanced mizen.
9. Allow seven points when under bare poles.

These allowances may be of some use to work up the day's work of a journal which has been neglected; but a prudent navigator will never be guilty of this neglect. A very good method of estimating the leeway is to observe the bearing of the ship's wake as frequently as may be judged necessary; which may be conveniently enough done by drawing a small semicircle on the tafferel, with its diameter at right angles to the ship's length, and dividing its circumference into points and quarters. The angle contained between the semidiameter which points right aft, and that which points in the direction of the wake, is the leeway. But the best and most rational way of bringing the leeway into the day's log is to have a compass or semicircle on the tafferel, as before described, with a low crutch or swivel in its centre; after heaving the log, the line may be slipped into the crutch just before it is drawn in, and the angle it makes on the limb with the line drawn right aft will show the leeway very accurately, which, as a necessary article, ought to be entered into a separate column against the hourly distance on the log-board.

In hard blowing weather, with a contrary wind and a high sea, it is impossible to gain any advantage by sailing. In such cases, therefore, the object is to avoid as much as possible being driven back. With this intention it is usual to lie to under no more sail than is sufficient to prevent the violent rolling which the vessel would otherwise acquire, to the endangering her masts, and straining her timbers, &c. When a ship is brought to, the tiller is put close over to the leeward, which brings her head round to the wind. The wind having then very little power on the sails, the ship loses her way through the water; which ceasing to act on the rudder, her head falls off from the wind, the sail which she has set fills, and gives her fresh way through the water, which, acting on the rudder, brings her head again to the wind. Thus the ship has a kind of vibratory motion, coming up to the wind and falling off from it again alternately. Now the middle point between those upon which she comes up and falls off is taken for her apparent course; and the leeway and variation is to be allowed from thence, to find the true course.

Ship's Journal.

The setting and drift of currents, and the heave of the sea, are to be marked down. These are to be corrected by variation only.

The computation made from the several courses, corrected as above, and their corresponding distances, is called a *day's work;* and the ship's place, as deduced therefrom, is called her place by *account*, or *dead reckoning.*

It is almost constantly found that the latitude by account does not agree with that by observation. From an attentive consideration of the nature and form of the common log, that its place is alterable by the weight of the line, by currents, and other causes, and also the errors to which the course is liable, from the very often wrong position of the compass in the binnacle, the variation not being well ascertained, an exact agreement of the latitudes cannot be expected.

When the difference of longitude is to be found by dead reckoning, if then the latitudes by account and observation disagree, several writers on navigation have proposed to apply a conjectural correction to the departure or difference of longitude. Thus, if the course be near the meridian, the error is wholly attributed to the distance, and the departure is to be increased or diminished accordingly; if near the parallel, the course only is supposed to be erroneous; and if the course is towards the middle of the quadrant, the course and distance are both assumed wrong. This last correction will, according to different authors, place the ship upon opposite sides of her meridian by account. As these corrections are, therefore, no better than guessing, they should be absolutely rejected.

If the latitudes are not found to agree, the navigator ought to examine his log-line and half-minute glass, and correct the distance accordingly. He is then to consider if the variation and leeway have been properly ascertained; if not, the courses are to be again corrected, and no other alteration whatever is to be made on them. He is next to observe if the ship's place has been affected by a current or heave of the sea, and to allow for them according to the best of his judgment. By applying these corrections, the latitudes will generally be found to agree tolerably well; and the longitude is not to receive any farther alteration.

It will be proper, however, for the navigator to determine the longitude of the ship from observation as often as possible; and the reckoning is to be carried forward in the usual manner from the last good observation; yet it will perhaps be very satisfactory to keep a separate account of the longitude by dead reckoning.

General Rules for working a Day's Work.

Correct the several courses for variation and leeway; place them, and the corresponding distances, in a table prepared for that purpose. From whence, by Traverse Sailing, find the difference of latitude and departure made good; hence the corresponding course and distance, and the ship's present latitude, will be known.

Find the middle latitude at the top or bottom of the traverse table, and the distance, answering to the departure found in a latitude column, will be the difference of longitude; or, the departure answering to the course made good, and the meridional difference of latitude in a latitude column, is the difference of longitude; the sum or difference of which, and the longitude left, according as they are of the same or of a contrary name, will be the ship's present longitude of the same name with the greater.

Ship's Journal.

Compute the difference of latitude between the ship and the intended port, or any other place whose bearing and distance may be required: find also the meridional difference of latitude and the difference of longitude. Now the course answering the meridional difference of latitude found in a latitude column, and the difference of longitude in a departure column, will be the bearing of the place, and the distance answering to the difference of latitude will be the distance of the ship from the proposed place. If these numbers exceed the limits of the table, it will be necessary to take aliquot parts of them; and the distance is to be multiplied by the number by which the difference of latitude is divided.

It will sometimes be necessary to keep an account of the meridian distance, especially in the Baltic or Mediterranean trade, where charts are used in which the longitude is not marked. The meridian distance on the first day is that day's departure; and any other day it is equal to the sum or difference of the preceding day's meridian distance and the day's departure, according as they are of the same or of a contrary denomination.

Ship's Journal.

It will be found very satisfactory to lay down the ship's place on a chart at the noon of each day, and her situation with respect to the place bound to and the nearest land will be obvious. The bearing and distance of the intended or any other port, and other requisites, may be easily found by the chart, as already explained; and indeed every day's work may be performed on the chart, and thus the use of tables superseded.

Specimens of a ship's journal may be found in the works on navigation already mentioned. The reader is also referred to these works for the traverse table, and tables of meridional parts, log. rising. middle time, half elapsed time, logarithmic difference, &c. which have been employed in the solution of the various problems.

END OF VOLUME FIFTEENTH.

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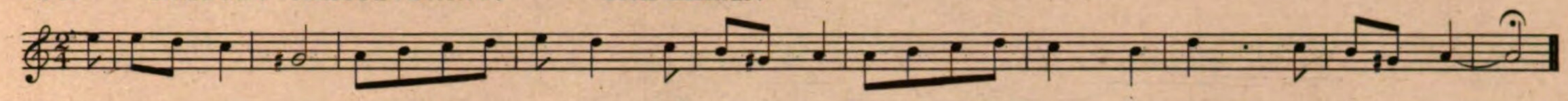
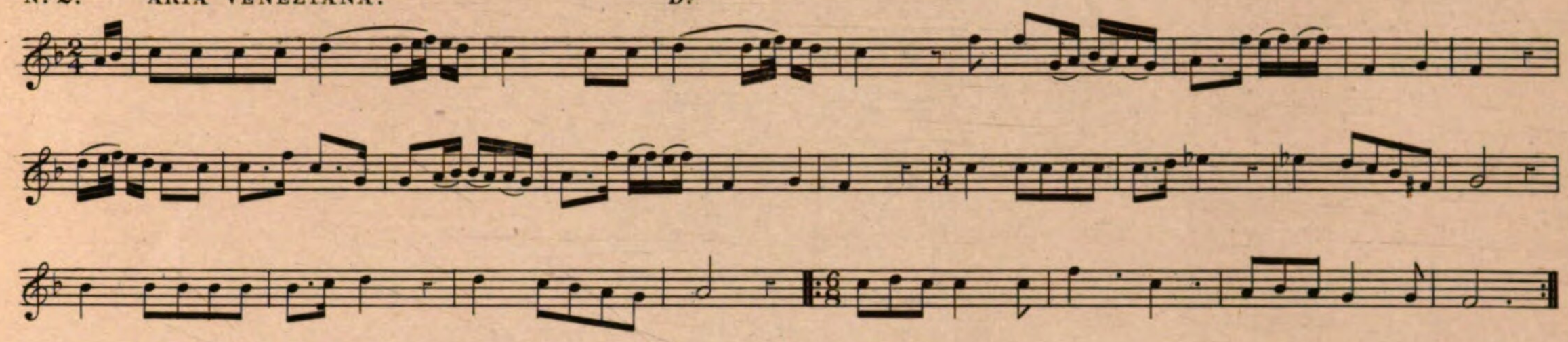
EXAMPLES OF MELODY.

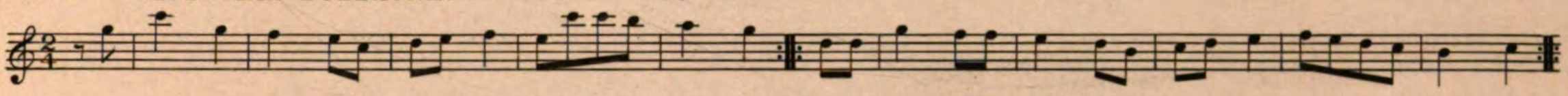
Nº 1. TAMBURO TRASTEVERINO. From Eximeno.



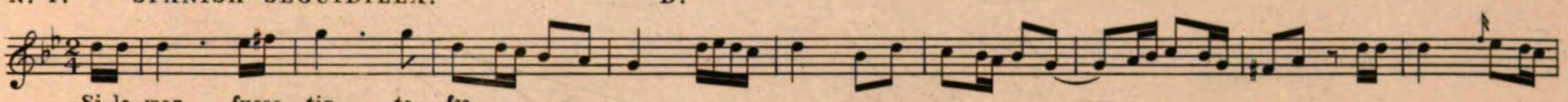
Nº 2. ARIA VENEZIANA. Dº



Nº 3. VALENTIAN DULZAYNA. Dº

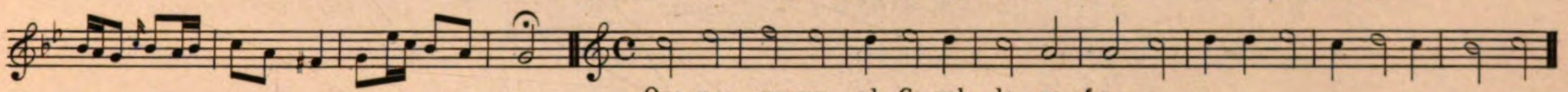


Nº 4. SPANISH SEGUIDILLA. Dº



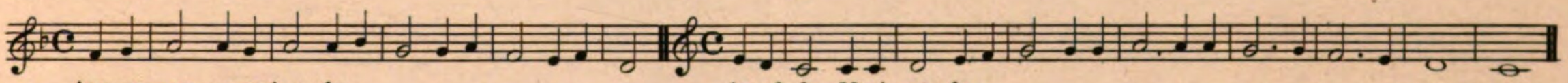
Si la mar fuese tin _ _ ta, &c.

Nº 5. OLD SPANISH or MOORISH AIR. From Salinas.



Que me querys el Ca_val _ le _ ro, &c.

Nº 6. Dº Dº

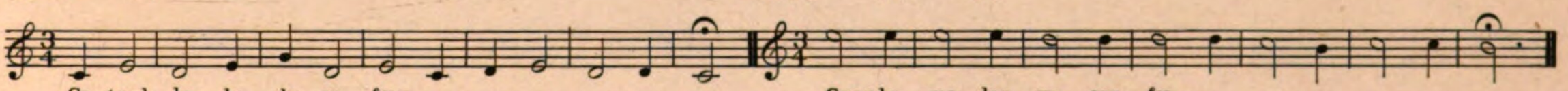


Aunque soy morenica, &c.

Nº 7. Dº Dº

Aquel_la Mori _ ca, &c.

Nº 8. Dº Dº

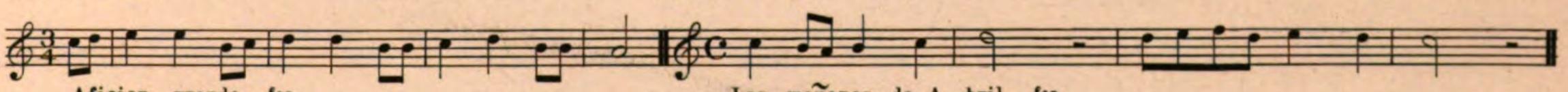


Ca_ta el lo _ bo do va, &c.

Nº 9. Dº Dº

Guarda me las va _ cas, &c.

Nº 10. Dº Dº

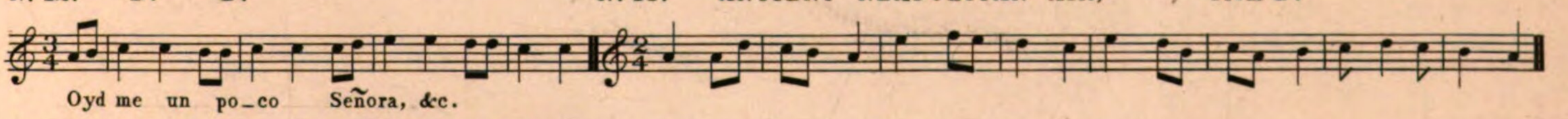


Aficion grande, &c.

Nº 11. Dº Dº

Las mañanas de A _ bril, &c.

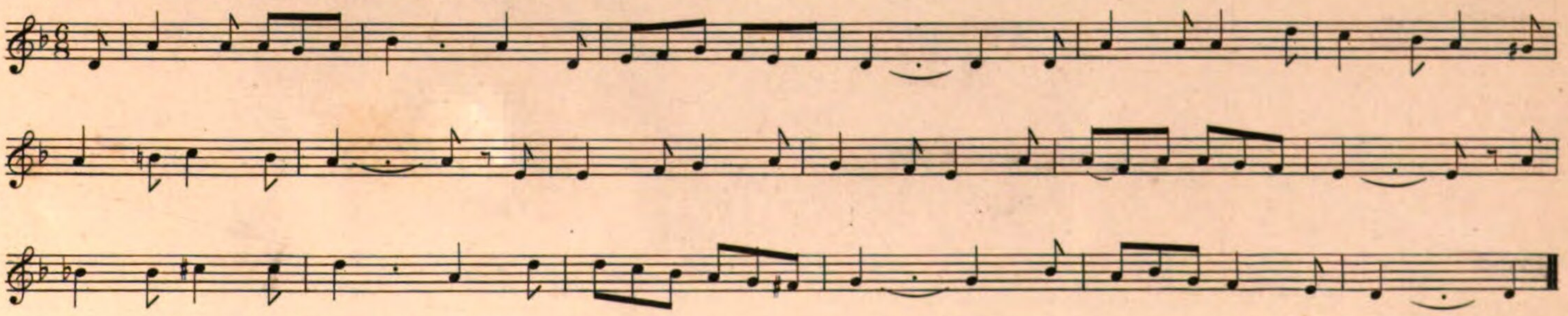
Nº 12. Dº Dº



Oyd me un po_co Señora, &c.

Nº 13. ANCIENT NEAPOLITAN AIR, From Dº

Nº 14. FRENCH AIR of 15th CENTURY. Ascribed to Jean Mouton.

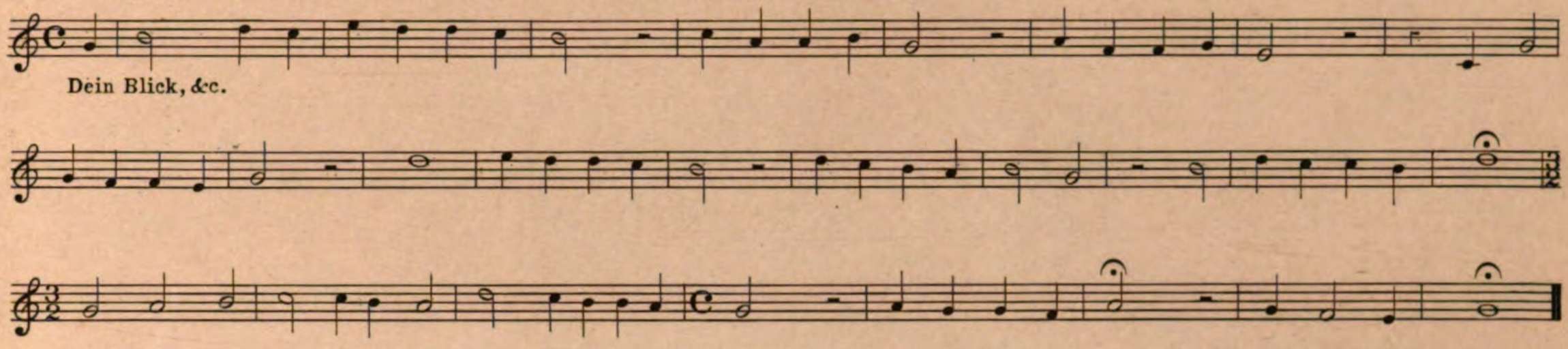


Geo. Aikman, Sculpt.

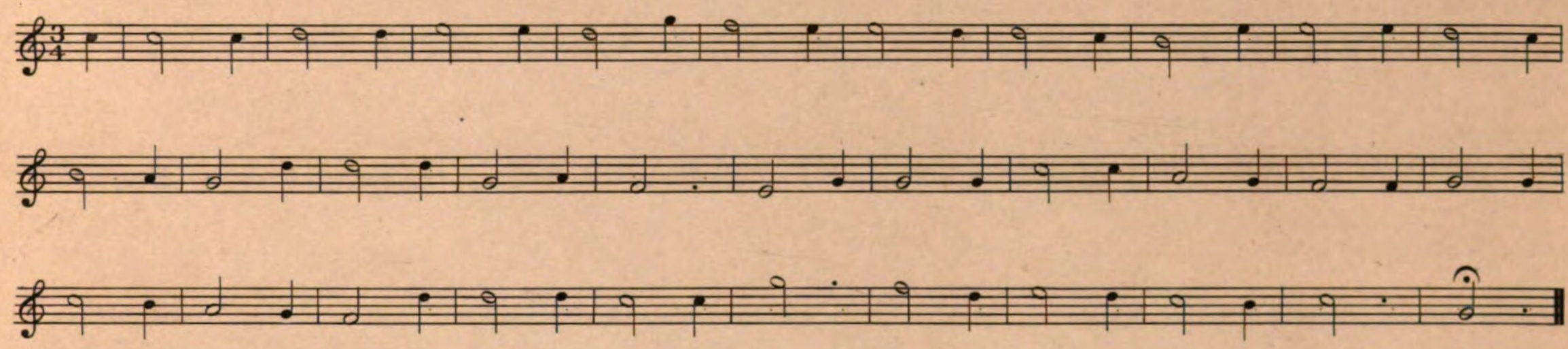
ANCIENT GERMAN MELODY
Trill.

EXAMPLES OF MELODY.

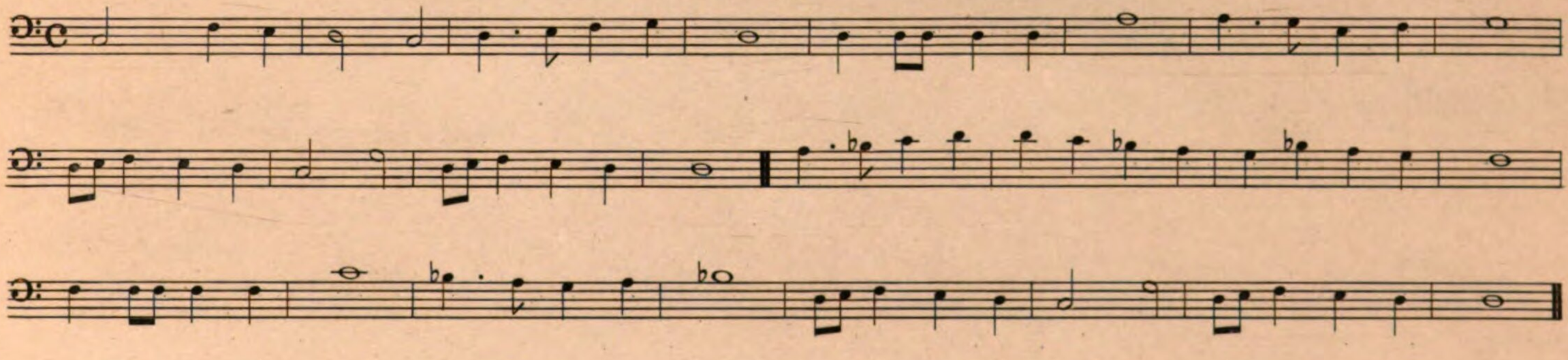
Nº 15. ANCIENT GERMAN MELODY. Beginning of 15th Century.



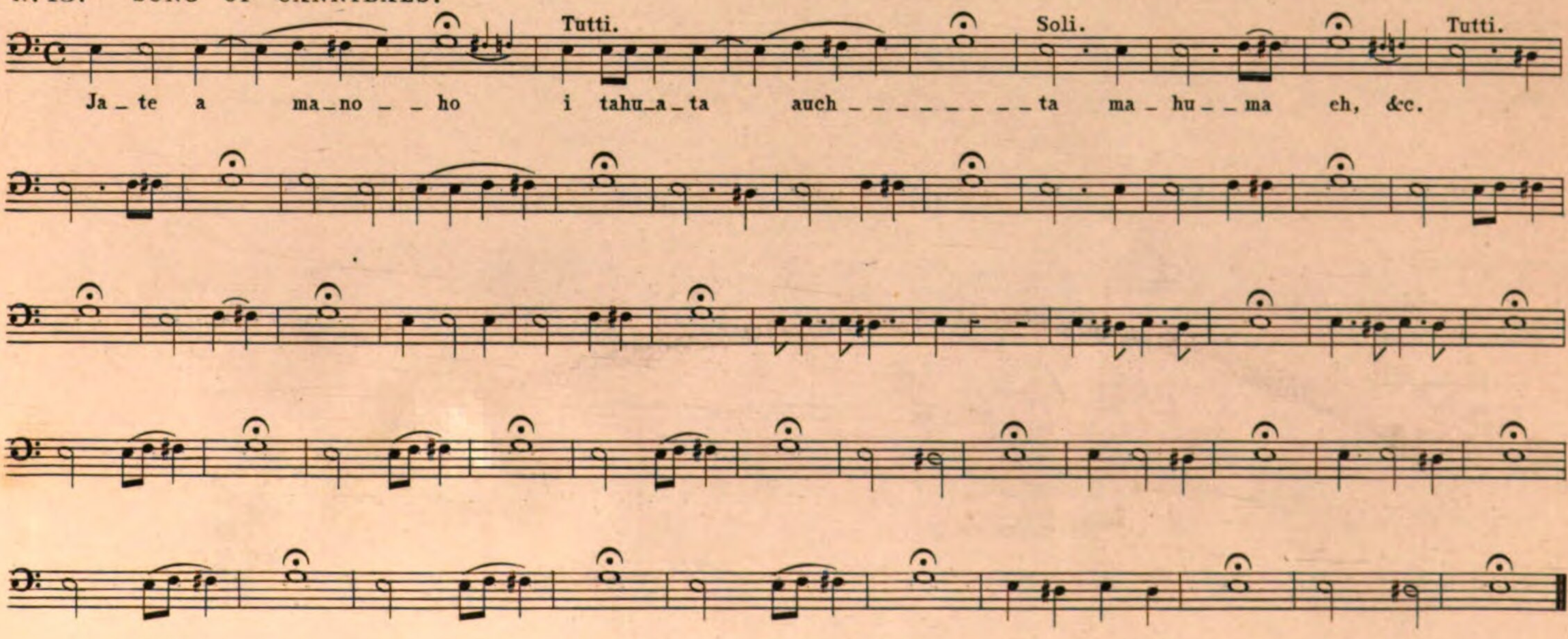
Nº 16. Dº Dº Dº



Nº 17. EGYPTIAN AIR. Performed in honour of Buonaparte at Cairo.



Nº 18. SONG OF CANNIBALS.



Geo Aikman, Sculpt

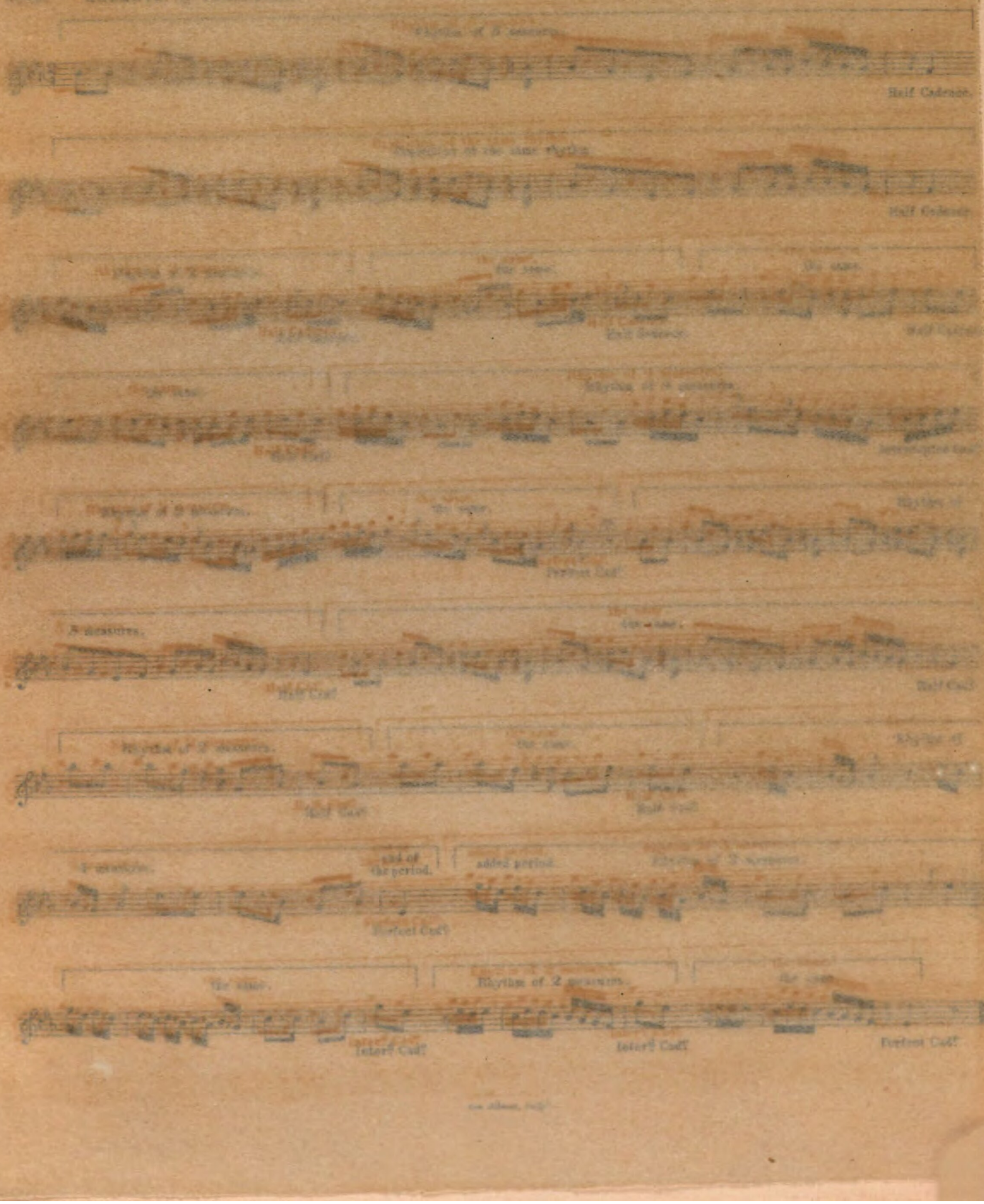
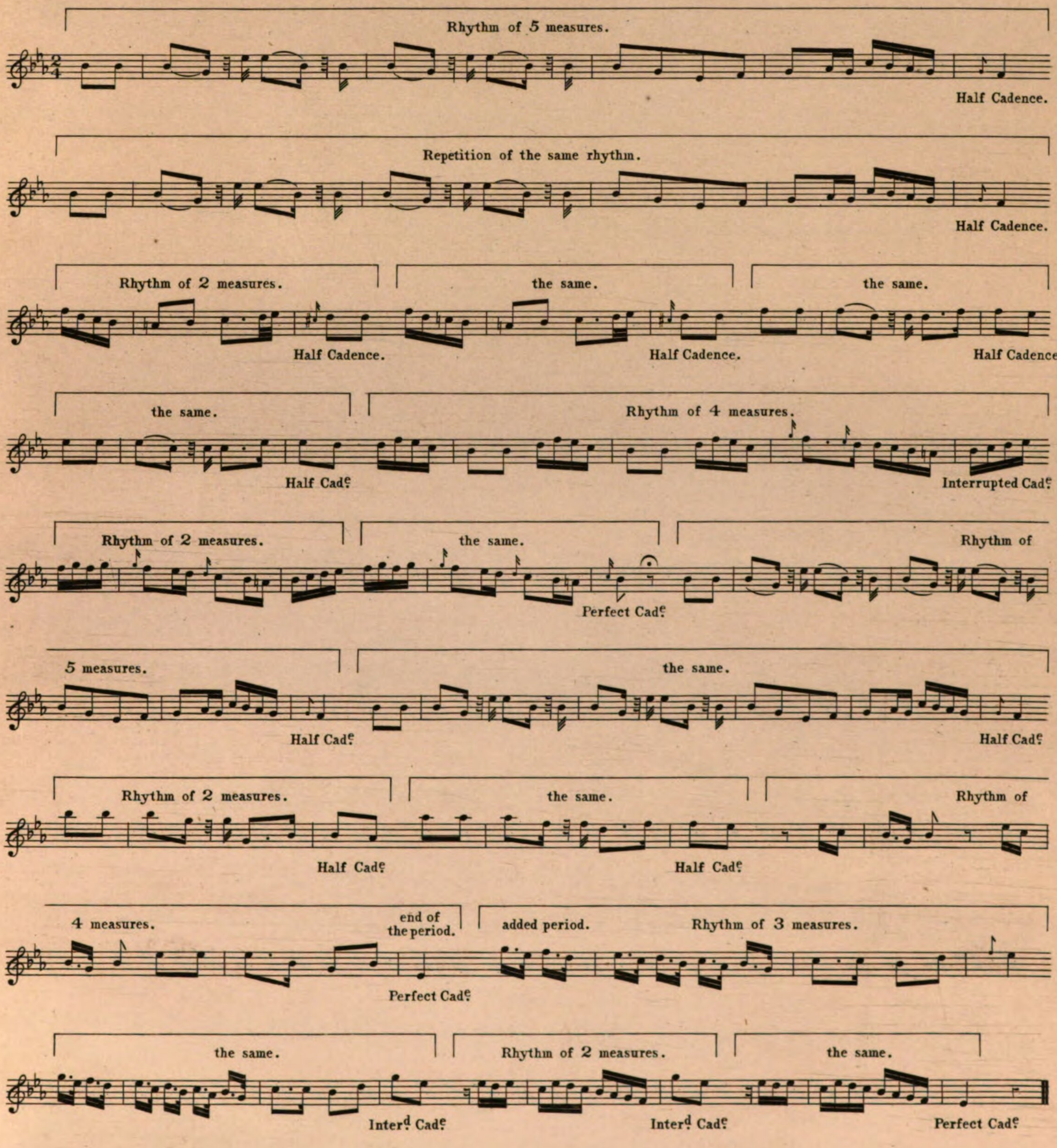

Half Cadence.
Perfect Cad?
Half Cad?
Perfect Cad?
Rhythm of 2 crotchets.
Perfect Cad?
Rhythm of 2 crotchets.
Perfect Cad?

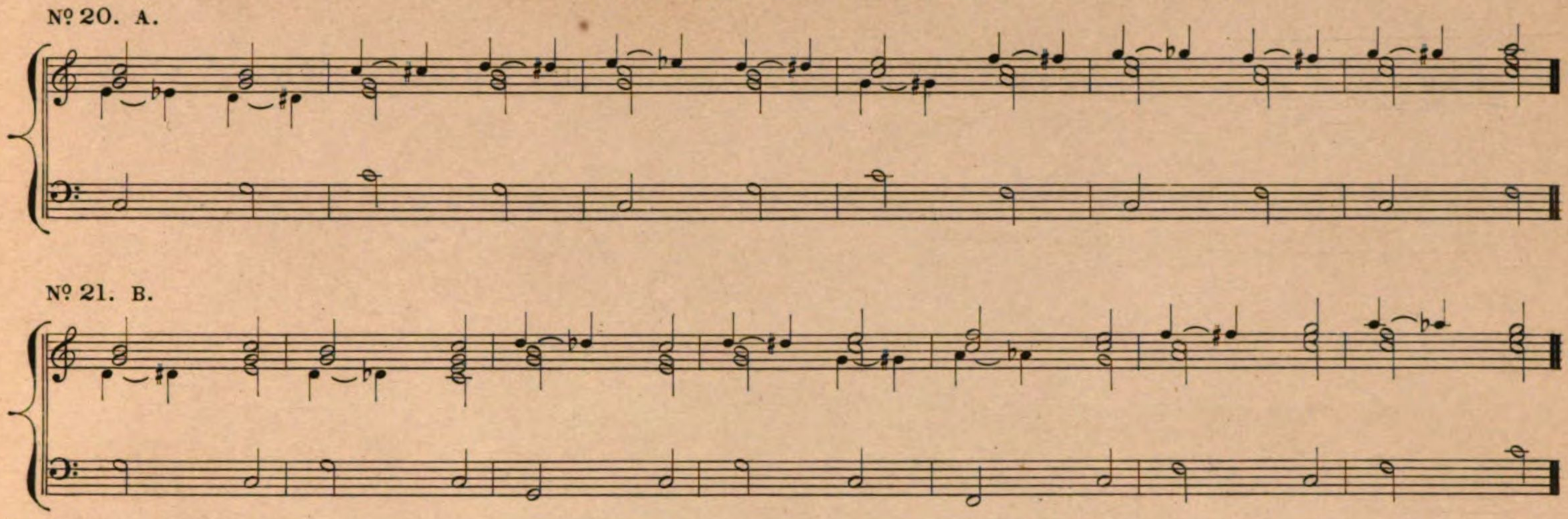
ILLUSTRATION OF RHYTHM AND STRUCTURE OF MELODY.

Nº 19. ANDANTE, by PAESIELLO.



Geo. Aikman, Sculpt.

ILLUSTRATIONS OF HARMONY.



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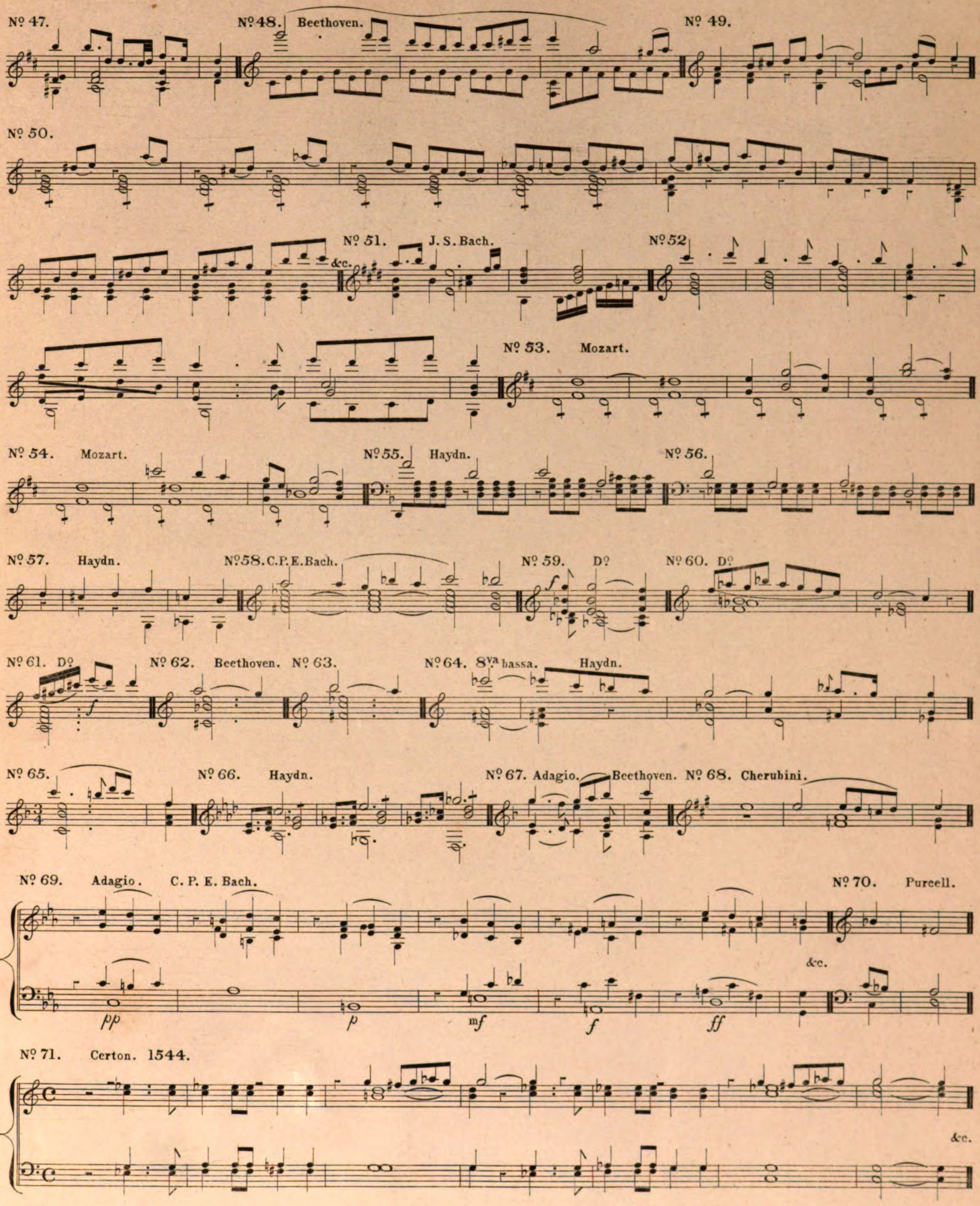
ILLUSTRATIONS OF HARMONY.



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5

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MDZ Münchener DigitalisierungsZentrum Digitale Bibliothek

The Encyclopaedia Britannica, or Dictionary of Arts, Sciences, and General Literature

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